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THE URUGUAY ROUND AND THE WORLD COPPER MARKET:

A PRELIMINARY OVERVIEW

Report by the UNCTAD secretariat

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Abbreviations

ACP	Africa, Caribbean and Pacific
avg	average
APEC	Asia-Pacific Economic Cooperation
ctrs	countries
Cu	copper content
DMEC	developed market-economy country
EFTA	European Free Trade Association
EU	European Union
GATT	General Agreement on Tariffs and Trade
GSP	Generalised system of preferences
HS	Harmonized System
ICSG	International Copper Study Group
kt	thousand tonnes
ktpy	thousand tonnes per year
LDC	least developed country
MFN	most favoured nation
MGAG	Metallgesellschaft AG
mtpy	million tons per year
NAFTA	North American Free Trade Agreement
NRCan	Natural Resources Canada
NTM	non-tariff measure
OECD	Organisation for Economic Co-operation and Development
p.a.	per annum
semi	semifabricate
SX-EW	solvent extraction-electrowinning
Taiwan PC	Taiwan Province of China (abbreviated in tables)
UR	Uruguay Round
WBMS	World Bureau of Metal Statistics
WTO	World Trade Organisation

Notes and definitions

Products

Tariffs for **copper ores and concentrates** are those for HS 260300 ("copper ores and concentrates").

Data for production and trade of **unrefined copper** comprise smelter products from primary and secondary sources, as well as low-grade electrowon production, unless otherwise indicated. Tariffs for unrefined copper are those for HS 740200 ("copper unrefined, copper anodes for electrolytic refining").

Data for production of **refined copper** comprise refinery products from primary and secondary sources, as well as high-grade electrowon production. Tariffs for refined copper are those of HS 740311 ("copper cathodes and sections of cathodes unwrought"), the most widely traded form of unalloyed refined copper.

Tariffs for **copper and copper alloy scrap** are those for HS 740400 ("waste and scrap, copper or copper alloy").

Tariffs for **copper and copper alloy semis** are the unweighted average of tariff lines comprised in the respective chapters, i.e.:

- copper wire - HS chapter 7408;
- copper plates, sheets and strip - HS chapter 7409;
- copper tubes and pipes - HS chapter 7411;

- copper bars, rods and profiles - HS chapter 7407;
- copper foil - HS chapter 7410.

Unwrought copper comprises copper ores and concentrates, unrefined metal and refined copper.

Regional groupings

Developed market-economy countries (DMEC) includes OECD countries (except Czech Republic, Mexico and Turkey) plus South Africa.

Developing countries includes the developing countries of Africa (excluding South Africa), America (including Mexico) and Asia (including Turkey) and the former Yugoslavia and its successor States.

Eastern Europe includes the former socialist countries of central and Eastern Europe (except for the former Yugoslavia and its successor States), including all republics of the former USSR.

Trade data for the **European Union** include intra-EU trade, unless otherwise specified. They refer to the 12 member countries prior to the accession of Austria, Finland and Sweden, unless otherwise specified.

Projections

The projections presented in this paper aim at giving an indication of the main trends and changes that are likely to affect the international copper market, based on information available at present. Therefore, they should not be taken to reflect precisely future developments in individual countries, given the time lag involved.

Projections for **mine and refined copper production capacity** are based on changes to capacity of individual plants as they have been announced by companies and governments in publicly available sources such as company reports, press releases, trade journals, etc.. Their execution, however, will be subject to several factors, including adjustments to changing market conditions and therefore they may not correspond exactly to what is foreseen at present.

Projections for world **refined copper consumption** were made on the basis of the historical trend calculated by the ICSG, which points to an annual growth rate of 3.32 per cent (Daniels (1995), p. 6). The country distributrion of the world total was calculated by applying average 1990-94 growth rates to 1992-94 consumption data for individual countries, plus some adjustments.

Projections for **supply of and demand for concentrates** suppose that smelters will keep the present proportion between primary and secondary sources and that new plants will use the raw materials foreseen in present plans.

Projections for **exports and imports of concentrates and of refined copper** have been adjusted to match each other. The method for assessing the country distribution of these trade flows is indicated in the respective tables.

INTRODUCTION AND SUMMARY

This report assesses the likely effects of the Uruguay Round agreements on the world copper market at the various processing stages of this commodity, from mining to the semifabricating level. It starts by examining the existing pattern of regional distribution of copper production and the trade flows of copper products that ensue at each processing stage. It then analyses the tariffs and non-tariff measures applied by present and potential large importers and the changes to these measures that the implementation of the Uruguay Round agreements will bring about.

The main conclusion is that the structural characteristics of the copper industry and the divergent rhythm of industrial growth across countries have an overwhelming importance in determining international trade flows in copper products up to the semifabricates level. However, tariffs on unwrought copper products do play a certain role in influencing the location of plants and historically they have been used as a means of fostering the development of a national metallurgical industry by offering them some form of protection. This function has been largely eliminated through tariff cuts during the post-war period, except for Japan. Among industrialized countries, this process will be further enhanced once the Uruguay Round agreements are implemented, since Japanese tariffs will be reduced substantially. In developing countries, by contrast, governments will continue to use tariffs as an instrument to underpin the establishment and expansion of domestic metallurgical industries. In order to be able to do so, in most cases they either have not made commitments relating to tariffs on unwrought copper products or, alternatively, have bound them at high levels.

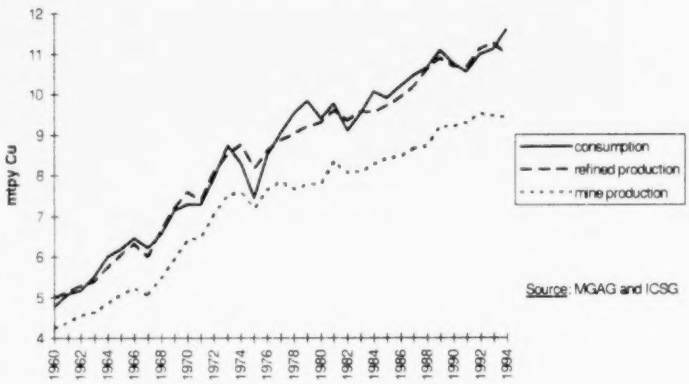
With regard to semimanufactures, import tariffs will be reduced in all major developed-country markets, but the trade-creating effects of this are likely to be mitigated by the regional pattern of international trade in these products and by the effects of regional trade agreements. Developing countries in general have not pledged to reduce tariffs on these products, so as to allow themselves wider policy options regarding the future development of their semifabricating industries. Semis may, however, be included in schedules offered by developing countries in future trade negotiations or, when tariffs have already been bound, they may be the object of cuts from present high levels.

I. CONSUMPTION

1. World consumption of copper grew continuously after World War II, spurred by the accelerated expansion of the world economy and, more specifically, by industrial production until the mid-1970s. Between 1960 and 1973 it expanded at an annual rate of 4.8%. In the following 12 years, demand for the metal continued to increase, but at a considerably reduced rhythm (1% p.a.). This was caused by: (i) slower world economic growth; (ii) declining intensity of use; (iii) miniaturization; (iv) substitution by other materials (e.g., aluminium, steel, plastics). Starting from the mid-1980s, however, some of the factors that had negatively affected demand for the metal weathered down or were reversed. This was partly due to the copper industry's increased investment in promotion of consumption of the metal, which aimed at avoiding further market losses to competing materials, regaining previously lost markets, as well as developing new end uses. Additionally, demand in some developing countries accelerated sharply. From 1986 onwards, consumption outside Eastern Europe rebounded vigorously, expanding at 3.5% p.a.. Between that year and 1994, world demand for the red metal increased from 10.2 million tons to 11.6 million tons (figure 1). Outside Eastern Europe, consumption expanded from 8.3 million tons to 10.5 million tons over the same period.

2. The regional distribution of copper consumption has changed markedly over the last 30 years. In the early 1960s, industrialized countries accounted for the bulk of world demand for the metal: 75%. They maintained this share during that decade, thanks largely to the quick growth in Japanese consumption. From the mid-1970s onwards, however, demand for the metal in developing countries expanded at a considerably higher rate than in either industrialized countries or Eastern Europe (table 1). This consumption growth was concentrated on East and South Asia, spurred by the expansion of the region's industry and infrastructure. Between the 1982-1984 and the 1992-1994 periods, demand for the metal in developing Asia more than doubled from 1 million tons to 2.5 million tons. The share of developing countries in total world demand rose very quickly from 10% in the early 1970s to 17% ten years later. The importance of these countries in terms of world copper consumption was further magnified after 1990, with the abrupt fall in Eastern European demand (see below). Therefore, the developing world came to account for one fourth of world consumption. Since the dynamism of its copper demand by far exceeded that of industrialized countries since the 1960s, the latter's share of global consumption fell continuously to 65% in 1992-1994.

Figure 1
World copper consumption and production, 1960-94



3. In the early 1990s another important development affected the regional distribution of copper demand: the steep fall of consumption in Eastern Europe. Since the last years of the previous decade, the dismantlement of the existing economic structures and the beginning of the transition to market economies caused the region's copper consumption to plummet from 1.9 million tons in 1988 to 1.4 million tons two years later. This trend accelerated in the following years, so that by 1994 the region's demand for copper had fallen to 570 kt, less than one third of the 1988 level. This sharp contraction in consumption was concentrated on the region's largest market, the former Soviet Union. Over these six years, the share of Eastern Europe in total world consumption fell from 18% to just 5%.

4. Present forecasts and projections point to an overall increase in the rhythm of consumption growth in the coming years, with rates ranging from 2.5% p.a. to 4.8% p.a.. This accelerated pace of copper consumption growth will be achieved particularly if the momentum of economic growth continues in developing countries (Asian and others) and if the larger Eastern Europe countries achieve a successful transition and their economies succeed in recovering from the present slump. As for industrialized countries, these projections assume that they will not undergo a major recession in the years to the end of the century.

Table 1

Consumption of refined copper by regions, 1962 - 1994

(annual average quantity in thousand tons; other data in percentage)

Region	1962 - 1964 quantity	1962 - 1964 share of world	1972 - 1974 quantity	1972 - 1974 share of world	1972 - 1974 a.a.g.r.	1982 - 1984 quantity	1982 - 1984 share of world	1982 - 1984 a.a.g.r.	1992 - 1994 quantity	1992 - 1994 share of world	1992 - 1994 a.a.g.r.
DMEC	4204.9	75.5	6031.2	72.4	3.7	6161.2	64.4	0.2	7349.1	65.4	1.8
America	*1739.4*	*31.3*	*2316.2*	*27.8*	*2.9*	*2147.1*	*22.5*	*-0.8*	*2587.8*	*23.0*	*1.9*
Europe	*1977.6*	*35.5*	*2521.1*	*30.3*	*2.5*	*2530.3*	*26.5*	*0.0*	*3158.8*	*28.1*	*2.2*
Asia	*370.2*	*6.7*	*1011.3*	*12.1*	*10.6*	*1275.9*	*13.3*	*2.4*	*1390.3*	*12.4*	*0.9*
Oceania	*86.5*	*1.6*	*123.5*	*1.5*	*3.6*	*128.6*	*1.3*	*0.4*	*141.3*	*1.3*	*1.0*
South Africa	*31.2*	*0.6*	*59.0*	*0.7*	*6.6*	*79.3*	*0.8*	*3.0*	*70.8*	*0.6*	*-1.1*
Developing ctrs.	406.8	7.3	798.0	9.6	7.0	1557.6	16.3	6.9	3143.2	28.0	7.3
America	*117.9*	*2.1*	*280.6*	*3.4*	*9.1*	*399.1*	*4.2*	*3.6*	*513.9*	*4.6*	*2.6*
Africa	*11.8*	*0.2*	*22.0*	*0.3*	*6.5*	*24.2*	*0.3*	*0.9*	*36.6*	*0.3*	*4.2*
Asia/Oceania	*219.7*	*3.9*	*403.1*	*4.8*	*6.3*	*1003.5*	*10.5*	*9.5*	*2535.9*	*22.6*	*9.7*
Europe	*57.4*	*1.0*	*92.2*	*1.1*	*4.9*	*130.8*	*1.4*	*3.6*	*56.8*	*0.5*	*-8.0*
Countries in Eastern Europe	954.2	17.1	1501.3	18.0	4.6	1840.9	19.3	2.1	736.7	6.6	-8.8
WORLD	**5565.9**	**100.0**	**8330.4**	**100.0**	**4.1**	**9559.7**	**100.0**	**1.4**	**11228.9**	**100.0**	**1.6**

Source: MGAG and ICSG

a.a.g.r. - Average annual growth rate since previous period

5. In developing countries growth in copper demand is bound to originate from infrastructure works (e.g., power generation and transmission, communication equipment, building (residential and commercial) and manufacturing of products which contain electrical mechanisms (e.g., industrial machinery, consumer goods, transportation equipment). In both developing and Eastern European countries, per capita consumption of copper at present corresponds to just one fifth of the level of developed countries. This indicates a large potential for the expansion of copper demand, provided that the standard of living of these countries improves in the coming years.

6. The bulk (60%) of the growth in refined copper consumption projected for the 1994-2000 period will originate from the dynamic economies of East and South Asia (table 2). This includes both those countries and territories where demand has been experiencing quick expansion for the last 15 years (China, Republic of Korea and Taiwan Province of China) and those where consumption accelerated in the more recent period of the 1990s (Malaysia, Thailand, Indonesia, Philippines and India). The United States of America and Western Europe are also projected to make a positive contribution to consumption expansion,

since their slower demand growth rate is compensated by their considerably larger present consumption volume (as compared to developing countries). The ten countries which are expected to make the largest contibution to consumption growth account for 90% of total projected demand expansion between 1994 and 2000 (table 2)[1].

7. In technical terms, refined copper is basically consumed by semifabricating mills that transform unwrought refined copper into semis like wire, plates, sheets, strip, tubes, piper, bars, rods profiles, foils, tubes and pipe fittings, etc. These products are made either of pure copper or of alloys of copper and other metals, like zinc, tin, nickel etc.. Thus, the bulk of refined copper consumption consists of the input to such semifabricating mills.

Table 2

Major net increases in projected copper demand, 1994-2000[a]

(quantity in thousand tons, share in percentage)

Country/area	quantity	share
China	573	22.8
Taiwan PC	360	14.3
United States	324	12.9
Korea, Rep. of	283	11.3
Frm. USSR	184	7.3
Thailand	151	6.0
Germany	149	5.9
Saudi Arabia	110	4.4
Malaysia	64	2.5
Philippines	58	2.3
Total above	2256	89.8
Memo item: EU - 15	263	11.0
WORLD	**2511**	**100.0**

Source: MGAG, ICSG and UNCTAD

General note: for explanation of methodology used, see notes on page 5

a - Difference between projected refined consumption in 2000 and actual consumption in 1994

[1] The presence of the republics of the former Soviet Union among the largest contributors to world demand growth is due to the fact that, as already mentioned, during the basis year of comparison (1994) their consumption was extremely low by historical standards: 341 kt, as compared to 919 kt in 1990.

II. THE COPPER PRODUCTION PROCESS AND INTERNATIONAL TRADE

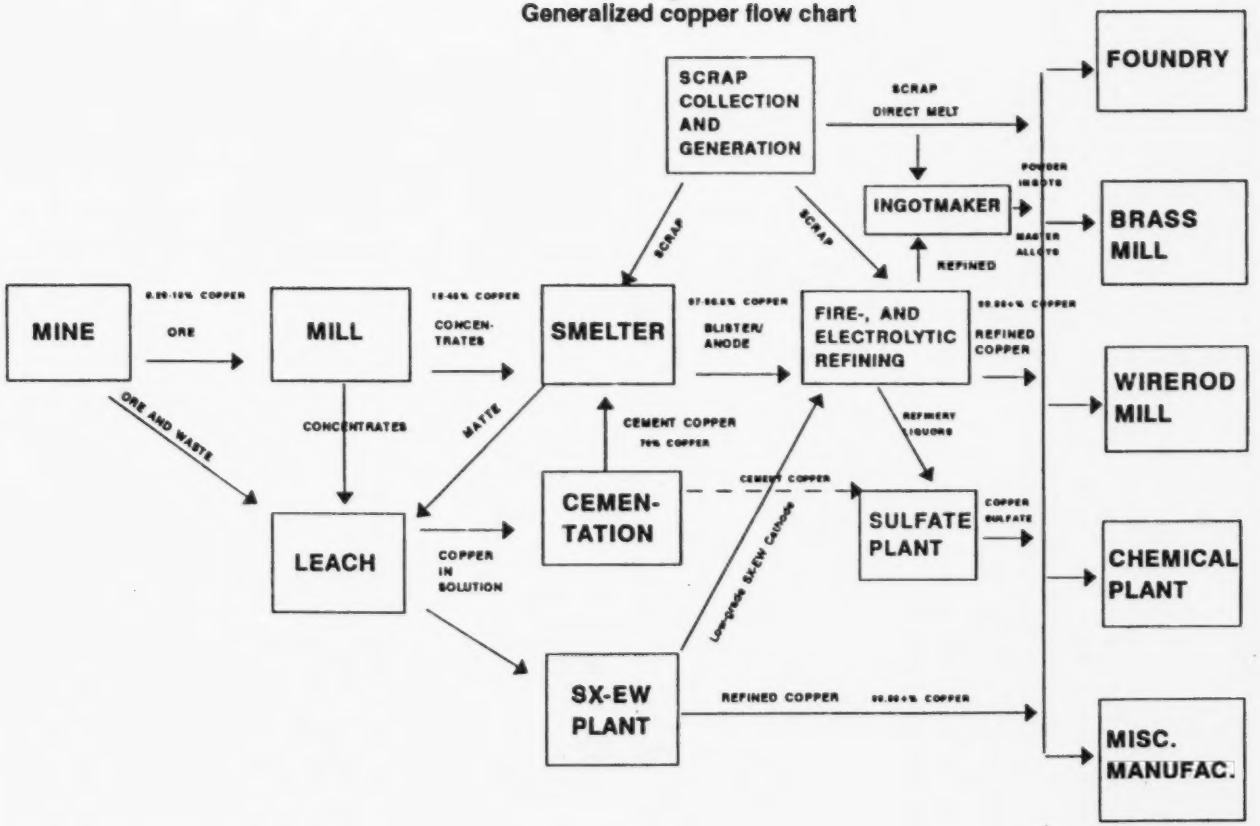
8. The cycle of copper production follows several stages from mining of ores to the production of semifabricates (or consumption of refined metal), as shown by the simplified material flow for the red metal in figure 2. The main producing units and their respective products along the life cycle of this metal before the fabricating stage are:

producing unit	product
mine/mill	ores and concentrates
smelter	unrefined copper (anodes, blister)
refinery	refined copper
SX-EW plant	unrefined copper (low-grade cathodes) or refined copper (high-grade cathodes)
semifabricating mill	copper and copper alloy semifabricates

9. Additionally, scrap constitutes another important element of the life cycle of copper. It is generated both at the semifabricating/fabricating level (new scrap) and when the life-cycle of final products containing copper (like electrical appliances, vehicles, buildings) comes to an end (old scrap). Depending on its degree of purity, it is used as an input of smelters or refineries or it is directly remelted by semifabricating mills (direct use of scrap or remelt).

10. The producing units at the different stages of processing are frequently located in different countries for several reasons (see annex), which generates international trade in each of the products mentioned above, including scrap. The markets, trade flows and corresponding trade measures at the various stages of the copper processing chain are quite different from each other. For this reason, each set of copper products will be analized separately in the coming chapters, in terms of production and trade patterns, as well as the tariffs and non-tariff measures that apply at present and as an outcome of the Uruguay Round.

Figure 2
Generalized copper flow chart



Source: ICSG

III. CONCENTRATES

A. Production

11. World mine production expanded quickly after World War II, on a par with demand growth. Mine output rose from 4 million tons in 1960 to 7.5 million tons in 1973, at an annual rate of 4.5%. In the following ten years, the growth rhythm slowed down considerably to 0.7% p.a., so that world output reached 8 million tons only in 1981. Since the mid-1980s, however, mine production expansion accelerated to 1.4% p.a., exceeding the level of 9 million in 1989 (figure 1).

12. North America was traditionally the major mine copper producing region, thanks to the large mining capacity of both the United States and Canada. However, the region lost market share during the 1980s, when the North American copper industry underwent a deep crisis. In order to secure its survival, it undertook a successful restructuring, so that its mine copper output rebounded from 1.8 mtpy in 1982-1984 to 2.5 mtpy ten years later. At present it accounts for approximately one fourth of world total production. However, this turnaround did not prevent North America from being surpassed by Latin America, whose copper output had been growing vigorously since the mid-1970s, expanding from 1.1 mtpy in 1972-1974 to 2.8 mtpy in 1992-1994 (table 3). The Latin American share of world output increased to 29% and the region became the world's largest producer. This growth was concentrated basically on Chile, which in 1982 displaced the United States as the largest mine copper producing country.

Table 3

Mine copper production by regions, 1962 - 1994

(quantity in thousand tons of copper, other data in percentage)

Region	1962 - 1964		1972 - 1974			1982 - 1984			1992 - 1994		
	quantity	share of world	quantity	share of world	a.a.g.r.	quantity	share of world	a.a.g.r.	quantity	share of world	a.a.g.r.
DMEC	1909.7	40.9	2959.2	40.1	4.5	2451.4	30.1	-1.9	3345.7	35.4	3.2
America	*1537.8*	*32.9*	*2294.2*	*31.1*	*4.1*	*1758.3*	*21.6*	*-2.6*	*2493.7*	*26.4*	*3.6*
Europe	*93.4*	*2.0*	*167.2*	*2.3*	*6.0*	*191.8*	*2.4*	*1.4*	*255.3*	*2.7*	*2.9*
Asia	*113.1*	*2.4*	*106.5*	*1.4*	*-0.6*	*48.0*	*0.6*	*-7.7*	*8.0*	*0.1*	*-16.4*
Oceania	*109.9*	*2.4*	*219.1*	*3.0*	*7.1*	*247.5*	*3.0*	*1.2*	*398.5*	*4.2*	*4.9*
South Africa	*55.5*	*1.2*	*172.3*	*2.3*	*12.0*	*205.7*	*2.5*	*1.8*	*190.1*	*2.0*	*-0.8*
Developing ctrs.	2064.5	44.2	3130.7	42.4	4.3	4138.7	50.8	2.8	4735.5	50.1	1.4
America	*853.0*	*18.3*	*1097.9*	*14.9*	*2.6*	*1849.4*	*22.7*	*5.4*	*2759.4*	*29.2*	*4.1*
Africa	*942.8*	*20.2*	*1299.7*	*17.6*	*3.3*	*1177.1*	*14.5*	*-1.0*	*543.9*	*5.7*	*-7.4*
Asia/Oceania	*209.7*	*4.5*	*624.1*	*8.5*	*11.5*	*990.4*	*12.2*	*4.7*	*1343.2*	*14.2*	*3.1*
Europe	*59.0*	*1.3*	*109.0*	*1.5*	*6.3*	*121.7*	*1.5*	*1.1*	*88.9*	*0.9*	*-3.1*
Countries of Eastern Europe	698.9	15.0	1293.0	17.5	6.3	1549.0	19.0	1.8	1379.2	14.6	-1.2
WORLD	**4673.1**	**100.0**	**7382.9**	**100.0**	**4.7**	**8139.1**	**100.0**	**1.0**	**9460.3**	**100.0**	**1.5**

Source: MGAG and ICSG

a.a.g.r. - Average annual growth rate since previous period

13. At the same time as Latin American production grew heftily, the output of developing Africa fell steeply in absolute terms. Until the mid-1970s the latter region produced a larger amount of mine copper than the former, but after 1975 African mine output fell abruptly. It was halved from 1.1 mtpy in 1982-1984 to 544 ktpy ten years later. This was brought about by the conjunction of negative factors in Zambia and especially in Zaire, like productive deficiencies, rising costs, lack of funds to finance expansion investment or replacements, as well as political turmoil. Consequently, the share of developing Africa in world mine copper output dwindled from 20% in the early 1960s to 15% 20 years later. Between 1982-1984 and 1992-1994, its mine production halved in absolute terms, while its share in world output fell even more steeply, to 6% (table 3). Elsewhere in developing countries, mine production of the metal has expanded in Asia and Oceania over the last two decades, though not at such a quick rhythm as in Latin America. The main producers there are Indonesia, Papua New Guinea and Philippines.

14. East European countries account for approximately 15% of world output, thanks mainly to the production of the Russian Federation, Poland and Kazakstan.

15. In the years to the end of the century, over half of the worldwide net increase in mine capacity is expected to be located in Chile, thanks to the start-up of several large new mining projects and to capacity expansion at existing plants. Added to the existing producing facilities, this should make Chile the location of 30% of total world mining capacity. Apart from this country, the main additions to mining capacity will take place in the United States, Russian Federation, Australasia and in other Latin American countries (table 4).

Table 4

Major net increases in mine copper production capacity, 1994-2000

(quantity in thousand tons per year of copper; share in percentage)

Country	quantity	share
Chile	2258	53.0
United States	324	7.6
Russian Fed.	323	7.6
Philippines	183	4.3
Argentina	180	4.2
Australia	157	3.7
Indonesia	150	3.5
Brazil	115	2.7
Iran, Isl. Rep. of	105	2.5
Zambia	99	2.3
Total above	3894	91.4
WORLD	**4260**	**100.0**

Source: UNCTAD

Note: for explanation of methodology used, see notes on page 5

Table 5

World copper production and trade, 1991 - 1993

(quantities in thousand tons per year of copper)

Processing stage	Production (A)	Imports (B)	Share of production traded B/A (%)
concentrates[a]	8543.6	2086.8	24.4
unrefined	9880.4	685.5	6.9
refined	11005.4	4431.8	40.3
semis[b]	10864.3	1959.7	18.0

Source: UNCTAD and ICSG

a - Production figure refers to concentrates processed through the conventional smelting/refining method (i.e., does not include SX-EW production)

b - Production based on refined copper consumption data; import figure supposes 80% Cu in reported copper alloy semis trade

B. Trade

16. **The general setting** - Contrary to the trend of world copper consumption and production, which experienced irregular growth trends over the last 30 years, world trade in unwrought copper has grown continuously over that period at an annual rate of between 2% and 3%. In terms of composition, international trade in concentrates has grown at the expense of unrefined copper since 1980. This was due on one side to the commissioning or expansion of mines (mostly in developing countries) which are not integrated to smelters and, on the other, to the sharp fall in exports of unrefined copper from Zaire (which until 1991 was the largest exporter of this product).

17. In the early 1970s Chile became the largest exporter of unwrought copper, displacing Zambia. Its lead over other

exporting countries has increased ever since and it now accounts for one fourth of total world exports. Chilean exports are mostly made up of refined metal (two thirds) and concentrates (almost one third). On the importing side, Japan became the largest unwrought copper importing country in the mid-1960s, a position it has kept ever since. At present it accounts for more than one fifth of world imports. Most of the other large importers have traditionally been West European countries, mainly Germany, Belgium, France, Italy and the United Kingdom. The three latter import almost all unwrought copper in the form of refined metal. Germany and Belgium also import concentrates and unrefined copper besides refined metal, since they possess large metallurgical capacities.

18. The main change over the last 15 years among importers was the emergence of Taiwan Province of China and the Republic of Korea. Whereas they had imported minor quantities until the mid-1970s, they became the fifth and sixth largest importers, respectively, in the early 1990s, prompted by the rapid growth in their copper demand.

Table 6

Largest importers of copper concentrates

(annual average quantity in thousand tons of copper; share in percentage)

Major importers, 1991 - 1993			Major potential importers, 2000[a]		
Country/area	**quantity**	**share**	**Country/area**	**quantity**	**share**
Japan	1023.3	49.0	Japan	1182	28.8
Germany	143.6	6.9	China	672	16.4
Spain	135.2	6.5	India	348	8.5
Canada	107.8	5.2	Germany	321	7.8
Brazil	107.0	5.1	Korea, Rep.of	319	7.8
Korea, Rep. of	105.2	5.0	Spain	249	6.1
CIS	87.7	4.2	Finland	137	3.3
Finland	78.8	3.8	Saudi Arabia	125	3.1
Philippines	76.3	3.7	Thailand	107	2.6
China	74.5	3.6	Uzbekistan	80	2.0
Total above	1939.4	92.9	Total above	3540	86.4
Memo item:			*Memo item:*		
EU - 15	373.0	13.5	EU - 15	770	18.8
WORLD	**2086.8**	**100.0**	**WORLD**	**4100**	**100.0**

Source: UNCTAD

General note: for explanation of methodology used, see notes on page 5

a - Difference between projected primary smelting capacity and domestic mining capacity.

19. **Concentrates** - International trade in copper concentrates expanded quickly as from the early 1960s, when it amounted to an annual volume of 268 ktpy in terms of copper content. The volume of trade rose to 1.5 mtpy Cu two decades later and continued growing during the 1980s, so that by 1991-1993 its had reached the level of 2.1 mtpy Cu. As a consequence of the growth of the concentrates market, approximately one fourth of mine production which is not processed through the SX-EW route enters international trade in the form of concentrates to be smelted/refined abroad rather then being processed domestically (table 5). This compares with just 6.3% in the early 1960s.

20. Initially, growth of trade in concentrates was mainly a consequence of the policy adopted by large importing countries, which built metallurgical industries whose raw material is supplied largely by imports of concentrates. This was the case primarily of Japan and, to a lesser extent, Germany. Japan is by far the largest importer of concentrates, accounting for almost half of world total imports. Germany is the second largest importer, even though the bulk of its imports of unwrought copper is made in the form of refined metal. Over the last 15 years, another factor that contributed to the expansion in international trade in concentrates was the widening gap between domestic smelting and mining capacities caused by the depletion or closure of domestic mines. This was the case of Spain, Brazil, Republic of Korea, Finland and Philippines (table 6). The combination of these factors explains why demand for copper concentrates has grown steadily over the last 15 years.

21. The increasing demand for concentrates over the last 15 years was supplied by the commissioning and expansion of mines not integrated to smelters, as happened mainly in Chile and, to a lesser extent, Indonesia, Portugal, United States and Mongolia. Even though the bulk of Chilean unwrought copper exports is made up of refined metal, the country is also the world's largest concentrates exporter. Its annual exports rose from 159 kt Cu in 1981-1993 to 564 kt Cu in the early 1990s (when it accounted for one fourth of the world total), thanks to the commissioning of several mining projects whose output is directed to exports of concentrates. Other large exporters of concentrates are Canada, United States, Indonesia, Papua New Guinea and Portugal (table 7). Canadian and to some degree United States mines have traditionally exported part of their output to Japan, while the three other countries do not possess smelters and export all of their mine production in the form of concentrates.

Table 7

Largest exporters of copper concentrates

(annual average quantity in thousand tons of copper; share in percentage)

Majors exporter, 1991 - 1993			Major potential exporters, 2000[a]		
Country/area	**quantity**	**share**	**Country/area**	**quantity**	**share**
Chile	564.4	25.3	Chile	1607	39.2
Canada	334.6	15.0	Indonesia	334	8.1
United States	253.4	11.4	Canada	306	7.5
Indonesia	207.4	9.3	Australia	297	7.2
P.N. Guinea	174.9	7.9	Russian Fed.	246	6.0
Portugal	171.6	7.7	P.N. Guinea	211	5.1
Mongolia	120.0	5.4	Argentina	200	4.9
Philippines	97.3	4.4	Philippines	168	4.1
Australia	72.1	3.2	Portugal	162	4.0
South Africa	40.4	1.8	Mongolia	155	3.8
Total above	2036.2	91.4	Total above	3686	89.9
Memo item:			*Memo item:*		
EU - 15	208.4	9.4	EU - 15	171	4.2
WORLD	**2227.6**	**100.0**	**WORLD**	**4100**	**100.0**

Source: UNCTAD

General note: for explanation of methodology used, see notes on page 5

a - Difference between projected mining capacity and domestic primary smelting capacity.

22. There is a potential for almost doubling the international trade in copper concentrates to over 4 million tons (in terms of copper content) between 1994 and the end of the century. On the exporting side, this will be the result of present plans to increase mining capacity (the output of which is to be processed through the conventional method) without corresponding increases in domestic smelting capacity. The main changes on the exporting side should be the increase in importance of Chile (to almost 40% of total exports), the emergence of Argentina (and possibly the Russian Federation) as exporter and the substantial growth in Australia's export potential (table 7).

23. The other side of the likely expansion of the concentrates market is the commissioning and/or expansion of smelters which treat concentrates but are not integrated to producing mines. Present plans for these plants indicate that Asia will account for approximately two thirds of total world imports of copper concentrates by the turn of the century. However, Japan is bound to lose its predominant role in the international market and, consequently, some of its power in negotiations of treatment and refining charges. While the Japanese smelting capacity is likely to remain unchanged in the coming years, there are plans for significant expansions in smelting capacity of China, India, Republic of Korea and, to a lesser extent, Saudi Arabia and Thailand. Since the increased smelting capacity will by far exceed domestic mining capacity, these countries will have to raise their concentrates imports substantially (table 6). This contrasts with the present situation in which India, Saudi Arabia and Thailand do not import concentrates at all. At the same time, the European Union should remain a large importer of concentrates (though still purchasing more foreign refined metal than concentrates).

C. Tariffs

1. Before the Uruguay Round

24. **The general setting** - International trade in copper (both unwrought and wrought) is not subject to the same forms of industrialized countries' protectionism that affects other commodities, particularly agricultural ones. The main developed importing countries do not impose quantitative restrictions on their copper imports, nor do they subsidize their exports of the commodity (including semis). The same is generally true for developing countries. The main instrument of trade policy affecting international copper trade is import tariffs.

25. In industrialized countries the bulk of imports of unwrought copper (at its three main stages of processing: ores/concentrates, unrefined and refined metal) are made duty-free or at low tariff rates, particularly if they originate from countries benefiting from the generalised system of preferences (GSP). Nevertheless, barriers against imports at the higher stages tend to be stronger than at the lower levels of processing (e.g, on refined metal as compared to concentrates), particularly in Japan. The same holds true for developing countries. Imports of unwrought copper are not subject to non-tariff measures in industrialised countries and the same happens in most developing countries. In contrast, imports of semifabricates are subject to considerably higher tariffs in both industrialized and developing countries and duty-free imports are rather the exception. Moreover, non-tariff measures are applied in some cases by both groups of countries.

26. **Ores and concentrates** - Imports of copper ores and concentrates, whatever their origin, enter duty-free the two main markets for the commodity - i.e. Japan and the European Union - and the same is true for Canada and Finland (table 8)[2]. Therefore, developing countries do not benefit from preferential treatment. No non-tariff measures or quota restrictions are applied in any of these markets. The United States applies a tariff of 1.7¢/kg on the lead content of concentrates. Imports from countries benefiting from the GSP have duty-free access to the United States market. United States tariffs are not very relevant, since the country is a large mine producer and imports only limited amounts of concentrates.

27. As for the main developing countries that import copper concentrates, MFN tariff rates vary considerably among them. At the lower end are those countries whose domestic mining capacity is nil or considerably lower than their smelting capacities. Therefore, they rely partly or totally on concentrates imports. Republic of Korea, Brazil and China apply 0% or 1% tariff rates. The Russian Federation, which increased its imports of concentrates probably on a temporary basis and for exceptional reasons[3] also imports this commodity duty-free. Higher tariffs are applied by countries whose mine production amounts to a significant share of smelter output: Philippines and Mexico (both with a 10% tariff). At the high end is India. This country ranges among the middle-size copper mine producers and its tariffs on all stages of copper processing are by far the highest among all relevant markets for these commodities. For concentrates, the tariff is 45%, while total charges amount to 90%[4].

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[2] Table 8, as well as the corresponding tables in the following chapters, present measures affecting copper trade before and after the Uruguay Round for the markets that are major importers at one stage of processing or another, as well as for some rapidly growing markets.

[3] Russian imports of concentrates increased after the collapse of the Soviet Union, as foreign producers and traders took advantage of the country's lower treatment and refining charges in tolling contracts, as compared to other countries' smelter/refineries. For the Russian Federation, these temporary imports of concentrates are a means of earning additional foreign exchange (at a time when domestic mine output fell sharply) and do not respond to domestic requirements. Until the late 1980s, the Russian copper industry was highly integrated from mining to refining and it did not import any significant amount of concentrates.

[4] Total charges in India consist of the basic duty (45%) plus auxiliary duty of customs (45%).

Table 8

Trade measures affecting imports of copper ores and concentrates before and after the Uruguay Round

(percentage, except for specific tariffs)

Country/ customs area	Share of world imports (1991 - 1993)	Pre-Uruguay Round						Uruguay Round	
		MFN range	MFN average	Total charge	NTM	GSP	LDC	Base rate of duty	Bound MFN rate
Japan	49.0	0 - 0	0	0	0	-	-	0	0
European Union	13.5	0 - 0	0	0	0	-	-	0	0
Canada	5.2	0 - 0	0	0	0	-	-	0	0
Brazil	5.1	0 - 0	0	2.2	0	-	-	n.a.[b]	n.a.[b]
Korea, Rep.of	5.0	1 - 1	1	1	0	-	-	1	1
Russian Fed.	4.2[a]	0 - 0	0	0	0	-	-	n.a.[e]	n.a.[e]
Finland	3.8	0 - 0	0	0	0	-	-	0	0
Philippines	3.7	10 - 10	10	19	0	-	-	n.a.[b]	n.a.[b]
China	3.6	0 - 0	0	0	0	-	-	0[f]	20[f]
United States	3.2	1.7 ¢/kg on Pb content	1.7 ¢/kg on Pb content	1.7 ¢/kg on Pb content	0	0[c]	-	1.7 ¢/kg on Pb cont.+ 0.7 ¢/kg on Zn cont.	1.7 ¢/kg on Pb content
Mexico	0.2	10 - 10	10	13.7	0	-	-		35[g]
Thailand	0	10 - 10	10	10	0	-	-	10	30
Malaysia	0	2 - 2	2	2	0	-	-	2	10
Taiwan PC	0	0 - 0	0	0.5	0	-	-	n.a.[e]	n.a.[e]
India	0	45 - 45	45	90	50[d]	-	-	85	40
Indonesia	0	5 - 5	5	7.5	0	-	-		40[g]
Switzerland	0	0 - 0	0	0	0	-	-	0	0
Hong Kong	0	0 - 0	0	0	0	-	-	0	0
Singapore	0	0 - 0	0	0	0	-	-	n.a.[b]	n.a.[b]

Source: UNCTAD (Trade Analysis and Information System) and WTO

a - Share of all imports of the CIS

b - Item not included in the country's UR Schedule

c - Excluding Mexico; zero tariff applies to Canada and Caribbean countries

d - Negative list applies to part of tariff line; non-automatic licence required

e - Not a member of WTO

f - Not a member of WTO. Tariffs mentioned are those included in schedule offered by China during UR negotiations

g - Uniform tariff ceiling

2. After the Uruguay Round

28. Among industrialized countries, tariffs on imports of copper concentrates will not be altered as a result of the implementation of the Uruguay Round Agreements. Imports will continue duty-free (Japan, European Union and Canada) or will be left at a low level (United States). As regards the main importers of the developing world, the Round will probably have a very limited direct effect on import tariffs. Some countries, like Brazil,

Philippines, Mexico and Indonesia, have not included copper concentrates in their schedules. This means their tariffs are not bound by the UR Agreements and can possibly be raised in the future, though this is not likely. Among developing countries that did include concentrates in their schedules of concessions, the Republic of Korea offered the same low rate as the present one (1%), while China[5], Thailand and India included high tariffs in their schedules: 20%, 30% and 40%, respectively. In the first two countries, the bound rate is substantially higher than the currently applied rate.

29. In other words, developing countries with an interest in copper concentrates trade have left themselves a great latitude in setting import duties on this commodity in the future (and the same is true for the other stages of processing, as will be seen in the following chapters). The actual level of their import duties will depend on the development of their domestic copper mining and metallurgical industries. Thus, countries which will have to rely heavily on imports of concentrates in order to feed their smelters are likely to levy low or nil tariffs. Otherwise, the economic viability of the existing and planned smelters would be jeopardized or domestic copper prices would be significantly higher than international ones. This policy of lowering or at least not raising import duties on concentrates is likely to be adopted by the developing countries that are the main potential importers in the year 2000 and beyond: China, India, Saudi Arabia, Thailand, Brazil, Namibia. On the other hand, those countries where imports will be competing with domestic mine output will probably levy slightly higher duties (Philippines, Mexico, Indonesia).

30. In conclusion, import tariffs on copper concentrates in major importers from both developed and developing countries are likely to remain at low levels or to fall in the coming years, given the import needs of their large and growing consuming markets.

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[5] China was a negotiating party during the Uruguay Round, but not a signatory of the Final Act. It offered a schedule of concessions, but as long as the country does not become a member of the WTO the schedule does not have legal binding force.

IV. UNREFINED COPPER

A. Production

31. Unrefined copper consists mostly of blister copper and copper anodes. The volume of world unrefined production exceeds that of mine output by 6%[6] and the geographical distribution of both stages of processing presents some striking differences. This is basically due to the existence of copper metallurgical industries in countries that have a smelting/refining capacity considerably larger than their mining capacity. The most important cases are Japan and, to a lesser extent, China, Germany, Spain, Republic of Korea and Brazil.

32. Overall, the share of industrialized countries in world unrefined copper production (47%) considerably exceeds its percentage of mine output (35%). Conversely, the share of developing countries in unrefined output (38%) is lower than its portion of world mine output (50%) (tables 9 and 3). This means that approximately one quarter of developing countries' copper mine production is smelted in industrialized countries.

Table 9

Unrefined copper production by regions, 1962 - 1994

(annual average quantity in thousand tons, other data in percentage)

Region	1962 - 1964[a] quantity	share of world	1972 - 1974[a] quantity	share of world	a.a.g.r.	1982 - 1984 quantity	share of world	a.a.g.r.	1992 - 1994 quantity	share of world	a.a.g.r
DMEC	2127.8	45.3	3488.5	47.8	5.1	3571.9	42.2	0.2	4671.1	46.8	2.7
America	*1544.0*	*32.9*	*1988.9*	*27.2*	*2.6*	*1509.4*	*17.8*	*-2.7*	*2212.1*	*22.2*	*3.9*
Europe	*187.2*	*4.0*	*367.9*	*5.0*	*7.0*	*678.4*	*8.0*	*6.3*	*813.9*	*8.2*	*1.8*
Asia	*256.3*	*5.5*	*793.7*	*10.9*	*12.0*	*1012.4*	*12.0*	*2.5*	*1160.6*	*11.6*	*1.4*
Oceania	*86.8*	*1.8*	*168.0*	*2.3*	*6.8*	*183.4*	*2.2*	*0.9*	*324.1*	*3.2*	*5.9*
South Africa	*53.5*	*1.1*	*170.0*	*2.3*	*12.2*	*188.3*	*2.2*	*1.0*	*160.4*	*1.6*	*-1.6*
Developing ctrs	1858.7	39.6	2476.7	33.9	2.9	3260.3	38.5	2.8	3761.3	37.7	1.4
America	*771.2*	*16.4*	*902.2*	*12.4*	*1.6*	*1490.6*	*17.6*	*5.1*	*1963.7*	*19.7*	*2.8*
Africa	*916.7*	*19.5*	*1241.8*	*17.0*	*3.1*	*1103.0*	*13.0*	*-1.2*	*517.6*	*5.2*	*-7.3*
Asia/Oceania	*122.1*	*2.6*	*198.7*	*2.7*	*5.0*	*549.6*	*6.5*	*10.7*	*1189.4*	*11.9*	*8.0*
Europe	*48.6*	*1.0*	*134.0*	*1.8*	*10.7*	*117.1*	*1.4*	*-1.3*	*90.6*	*0.9*	*-2.5*
Countries in Eastern Europe	711.8	15.1	1333.7	18.3	6.5	1625.6	19.2	2.0	1552.2	15.5	-0.5
WORLD	**4698.3**	**100.0**	**7298.9**	**100.0**	**4.5**	**8457.8**	**100.0**	**1.5**	**9984.5**	**100.0**	**1.7**

Source: MGAG, WBMS and ICSG

a.a.g.r. - Average annual growth rate since previous period

a - Data refer only to primary smelter production

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[6] This discrepancy is due to two facts: i) at present 90% of mine output is processed in smelters, while the balance takes the SX-EW route; and ii) mine products are not the only source of feed to smelters, some of which use also (or exclusively) scrap as an input. Thus, the higher level of smelter production as compared to mine output means that at present the volume of scrap collected and fed into smelters exceeds that of SX-EW production.

B. Trade

33. Unrefined copper exports have been declining in relation to total volume of trade in unwrought copper since the early 1960s. This was due basically to the fact that some large developing country mine producers expanded the processing of their mine output and thus increased their exports of refined copper. Moreover, trade in blister and anodes decreased due to the fall in absolute terms of production and exports of Zaire (then the largest exporter) from 1987 onwards. Consequently, the share of unrefined copper in total unwrought trade at present is lower than 10%. Moreover, only 7% of world blister production enters international trade (table 5). The reason for that is that the bulk of smelter output is refined in the same country where unrefined copper is produced, mostly in integrated smelter-refinery operations.

Table 10

Largest unrefined copper trading countries, 1991 - 1993

(annual average quantity in thousand tons of copper; share in percentage)

Major importers			Major exporters		
Country/area	**quantity**	**share**	**Country/area**	**quantity**	**share**
Belgium	202.2	29.5	Chile	105.9	18.6
United States	113.3	16.5	Mexico	103.0	18.1
China	74.0	10.8	Zaire	90.0	15.8
Germany	61.3	8.9	Peru	82.2	14.5
Korea, Rep. of	49.2	7.2	Namibia	32.7	5.8
Turkey	35.9	5.2	Finland	31.7	5.6
Japan	34.5	5.0	South Africa	23.4	4.1
Spain	31.8	4.6	Spain	22.3	3.9
Mexico	23.8	3.5	Belgium	17.9	3.1
United Kingdom	16.7	2.4	United States	16.5	2.9
Total above	642.5	93.7	Total above	525.6	92.4
Memo item:			*Memo item:*		
EU - 12	328.5	47.9	EU - 12	44.0	7.7
WORLD	**685.5**	**100.0**	**WORLD**	**568.7**	**100.0**

Source: UNCTAD

34. Since the early 1970s the largest exporter of unrefined copper was Zaire, but its production difficulties caused it to be overtaken by Chile and Mexico in the early 1990s (table 10). Although the South American country became the largest exporter of blister and anodes, its exports of these products amount to a minor fraction of its total mine copper output. In Mexico, by contrast, unrefined copper exports correspond to one third of domestic mine production. The country upgraded its copper exports from concentrates to blister during the 1980s, thanks to the commissioning of two new smelters and the expansion of a third without the corresponding refining capacity. Still in Latin America, Peru exports approximately one fourth of its mine copper production processed to the unrefined level, because the country's smelting capacity exceeds the capacity of its refineries by 100 ktpy Cu.

35. The largest importer of unrefined copper has traditionally been Belgium, thanks to its ties with the Zairean copper industry and to its large refining capacity. The latter exceeds Belgian smelting capacity by more than 50%. Other large importers of copper anode and blister are the United States and countries that refine at least part of domestic copper requirements, instead of importing all of it in refined metal form, like China, Germany and Republic of Korea (table 10).

36. In the coming years, international trade in unrefined copper is likely to remain limited as compared to the growing volumes of trade in concentrates and refined copper. The reason for that is that most smelters presently undergoing expansion or construction or which are being planned are integrated smelter-refinery operations. This means that smelter output is further processed to refined metal at the same site and therefore does not enter international trade. Chilean smelting capacity is bound to exceed its refining capacity by over 250 ktpy at the end of the century (thus indicating potential unrefined copper exports), but this dwindles in comparison to its potential exports of refined metal (2.3 mtpy) and concentrates (1.6 mtpy). A possible source

of growth of exports of unrefined copper would be the rebounding of Zairean production and exports. However, this is not likely to happen in the short term, since restarting operations that have not been operating for years will require a considerable amount of investment and time. Nevertheless, even if this were to be done, unrefined copper would continue to lose significance in the international copper trade.

C. Tariffs

1. Before the Uruguay Round

37. Like copper concentrates, imports of unrefined copper enter their main market (the European Union) duty-free and the same is true in Canada (which is a minor importer). Therefore, developing countries do not benefit from preferential treatment in these markets. However, unrefined copper is subject to higher import tariffs than concentrates in the other major importing markets (table 11). The United States levies a tariff of 1% on the Cu content of unrefined copper. Under the GSP, imports of this item are made duty-free. However, there are limits to the use of the scheme by the most competitive suppliers: Chile and Mexico. Preferential treatment is not given to the former country, while reduced competitive need limits apply to Mexican ones. These two countries (the world's two largest exporters of unrefined copper) account for approximately 60% of United States imports of copper anodes and blister.

38. By far the highest tariff on imports of unrefined copper among industrialised countries is levied by Japan: ¥ 15/kg[7]. This is a temporary rate, marginally lower than the country's GATT-bound (post-Tokyo Round) rate of 7.3%. Between 1991 and 1993, it amounted to an *ad-valorem* equivalent of 6%. This is a remainder of the country's post-war policy of fostering the development of a domestic copper metallurgical industry (as well as that for other metals). One of the means used was tariff protection at the unrefined and refined copper level, so as to favour imports of concentrates for domestic processing. Under the GSP scheme, Japan allows duty-free imports of unrefined copper. Although there are relatively low ceilings to yearly imports under the scheme, they are not always enforced. In any case, the country's imports of unrefined copper amount to only 6% of those of refined metal, which faces a similar tariff treatment.

39. In developing countries that have followed a policy of favouring imports of unwrought copper at lower levels of processing, the tariffs on unrefined copper is higher than the one on concentrates, e.g., 6% in China and 2.7% in the Republic of Korea, as compared to 0% and 1% for concentrates, respectively.

2. After the Uruguay Round

40. Import duties on unrefined copper will generally be reduced as a result of the commitments undertaken during the Uruguay Round. They will be eliminated by the United States and Republic of Korea, whose imports will therefore enjoy the same duty-free treatment as those of the largest market, the European Union (table 11). In Japan, the tariff will be reduced to 3%[8].

41. In the case of China (the third largest importer), the bound rate indicated in the schedule that the country offered during the Round is 15% (as compared to the 6% rate levied at present). If the country's primary refinery output continues to exceed its primary smelter production and this gap is at least partly filled by imports of unrefined metal, it is unlikely that tariffs rates will be raised. They should rather be kept at the present level or even be reduced in the future.

42. In conclusion, whatever tariff rates China applies, there will be an overall lowering of import tariffs in some of the major markets as a result of the implementation of the UR agreements.

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[7] A lower tariff and even duty-free treatment apply when the import price exceeds certain levels. However, these prices have not been reached over the last 10 years. Therefore, the highest tariff line is the only one effectively applied.

[8] Also after the implementation of the UR schedule, duty-free treatment will apply when the import price exceeds a very high level, which is unlikely to be reached . Therefore, the 3% tariffs line will probably be the only one to by applied in the future.

Table 11

Trade measures affecting imports of unrefined copper before and after the Uruguay Round

(percentage, except for specific rates)

Country/ customs area	Share of world imports (1991 - 1993)	Pre-Uruguay Round						Uruguay Round	
		MFN range	MFN average	Total charges	NTM	GSP	LDC	Base rate of duty	Bound MFN avg
European Union	47.9	0 - 0	0	0	0	-	-	0	0
United States	16.5	1% on value of Cu content	1% on value of Cu content	1% on value of Cu content	0	0[a]	-	1% on value of Cu content	0
China	10.8	6 - 6	6	6	0	-	-	6[f]	5[f]
Korea, Rep. of	7.2	4 - 4	4	4	0	-	-	20	0
Turkey	5.2	not avlb.	not avlb.	not avlb.	not avlb.	-	-	n.a.[b]	n.a.[b]
Japan	5.0	¥ 0 - 15/ kg[g]	¥ 15/kg[h]	¥ 15/kg[h]	0	0[e]	-	7.3	3[i]
Mexico	3.5	10 - 10	10	13.7	0	-	-		35[j]
Canada	2.1	0 - 0	0	0	0	-	-	0	0
Austria	1.0	0 - 0	0	0	0	-	-	0	0
India	0.2	65 - 65	65	110	0	-	-	n.a.[b]	n.a.[b]
Brazil	0	0 - 0	0	2.2	0	-	-	10	10
Indonesia	0	5 - 5	5	7.5	0	-	-		40[j]
Philippines	0	10 - 10	10	19	0	-	-	n.a.[b]	n.a.[b]
Taiwan PC	0	0 - 0	0	0.5	0	-	-	n.a.[d]	n.a.[d]
Thailand	0	6 - 6	6	6	0	-	-	6	6
Malaysia	0	2 - 2	2	2	0	-	-	2	5
Switzerland	0	CHF 0.2/ 100 kg	CHF 0.2/ 100 kg	CHF 0.2/ 100 kg	0	0[c]	-	CHF 0.2/ 100 kg	CHF 0.14/ 100 kg
Hong Kong	0	0 - 0	0	0	0	-	-	0	0
Singapore	0	0 - 0	0	0	0	-	-	20	10

Source: UNCTAD (Trade Analysis and Information System) and WTO

a - Excluding Chile; reduced competitive need limits applied to Mexico; zero tariff applied also to Canada and Caribben countries

b - Item not included in country's UR schedule

c - Same rate for EEC and EFTA countries

d - Not a member of WTO

e - Quantitative restrictions may be applied

f - Not a member of WTO. Tariffs mentioned are those included in schedule offered by China during UR negotiations

g - Depending on level of import price (temporary rate; GATT-bound rate: 7.3%)

h - Most frequently applied rate (temporary rate; GATT-bound rate: 7.3%)

i - Rate likely to be most frequently applied. Imports will be duty-free if import price exceeds ¥ 490/kg

j - Uniform tariff ceiling

V. REFINED COPPER

A. Production

43. World refined copper production (from primary and secondary sources) historically followed roughly the same developments as refined consumption (figure 1). Its growth was quite accelerated until the mid-1970s but slowed down considerably in the following 10 years. Until 1974 world output expanded at an annual rate of 4.1% but slowed down significantly to 0.9% p.a. between 1975 and 1982. Thereafter, however, refined production growth rebounded to an annual rate of 1.9% (which is still a slower rhythm than that of the 1970s). Excluding Eastern Europe, the pace was of 2.7% p.a.. The volume of total world output of refined copper grew from 9.3 million tons in 1980 to above 10 million tons seven years later and has exceeded the level of 11 million tons since 1992.

44. Production of primary refined copper has traditionally been more concentrated on the main consuming countries than the mining and even the unrefined stages of processing. This explains why some countries like Japan, Germany and Belgium are among the leading producers of refined copper although they do not have any significant mining capacity. The same rationale applies to some relatively industrialized developing countries like China, Republic of Korea and Brazil, whose refining capacities largely exceed their mine production.

Table 12

Refined copper production by regions, 1962 - 1994

(annual average quantity in thousand tons, other data in percentage)

Region	1962 - 1964		1972 - 1974			1982 - 1984			1992 - 1994		
	quantity	share of world	quantity	share of world	a.a.g.r.	quantity	share of world	a.a.g.r.	quantity	share of world	a.a.g.r.
DMEC	3504.8	64.0	4967.5	58.7	3.5	4768.3	50.2	-0.4	5928.9	53.3	2.2
America	*2095.3*	*38.3*	*2546.5*	*30.1*	*2.0*	*2024.7*	*21.3*	*-2.3*	*2754.2*	*24.7*	*3.1*
Europe	*993.1*	*18.1*	*1232.6*	*14.6*	*2.2*	*1367.4*	*14.4*	*1.0*	*1576.0*	*14.2*	*1.4*
Asia	*302.4*	*5.5*	*918.9*	*10.9*	*11.8*	*1034.0*	*10.9*	*1.2*	*1156.2*	*10.4*	*1.1*
Oceania	*99.5*	*1.8*	*182.2*	*2.2*	*6.2*	*192.6*	*2.0*	*0.6*	*316.0*	*2.8*	*5.1*
South Africa	*14.5*	*0.3*	*87.3*	*1.0*	*19.7*	*149.5*	*1.6*	*5.5*	*126.5*	*1.1*	*-1.7*
Developing ctrs.	1128.4	20.6	1931.2	22.8	5.5	2856.0	30.1	4.0	3830.8	34.4	3.0
America	*337.6*	*6.2*	*606.5*	*7.2*	*6.0*	*1239.6*	*13.1*	*7.4*	*1915.3*	*17.2*	*4.4*
Africa	*606.2*	*11.1*	*927.4*	*11.0*	*4.3*	*825.0*	*8.7*	*-1.2*	*500.4*	*4.5*	*-4.9*
Asia/Oceania	*135.8*	*2.5*	*258.3*	*3.1*	*6.6*	*665.4*	*7.0*	*9.9*	*1332.4*	*12.0*	*7.2*
Europe	*48.8*	*0.9*	*139.1*	*1.6*	*11.0*	*126.1*	*1.3*	*-1.0*	*82.7*	*0.7*	*-4.1*
Countries in Eastern Europe	842.4	15.4	1568.7	18.5	6.4	1864.8	19.7	1.7	1372.0	12.3	-3.0
WORLD	**5475.6**	**100.0**	**8467.5**	**100.0**	**4.5**	**9489.2**	**100.0**	**1.1**	**11131.6**	**100.0**	**1.6**

Source: MGAG and ICSG

a.a.g.r. - Average annual growth rate since previous period

Table 13

Major net increases in refined copper production capacity, 1994-2000[a]

(quantity in thousand tons per year of copper; share in percentage)

Country	quantity	share
Chile	1623	42.7
India	416	10.9
United States	334	8.8
Mexico	175	4.6
China	160	4.2
Korea, Rep. of	155	4.1
Zaire	150	3.9
Indonesia	130	3.4
Saudi Arabia	120	3.2
Thailand	120	3.2
Total above	3384	88.9
WORLD	**3805**	**100.0**

Source: UNCTAD

General note: for explanation of methodology used, see notes on page 5

a - Net increase in refining capacity (including high-grade SX-EW)

45. The largest refined copper producer has traditionally been the United States, which at present accounts for almost one fifth of world output. Among developing countries, production of refined metal over the last 15 years followed a path similar to that of mine production. Latin America and, to a lesser extent, Asia increased their market shares while that of Africa fell (table 12). In the first case, this was due to the expansion of refined metal output in Chile at an annual rate of 3%. The country's share in world supply increased from 8% to 11% and it became the world's second largest refined copper producer. Over the same period, production of refined metal in developing Asia grew by 8% p.a., thanks to the commissioning of refineries in China, Philippines, Republic of Korea, Islamic Republic of Iran and Turkey. Africa's output, by contrast, declined steadily since the mid-1980s at an annual rate of 4.4%. Zambian and Zairean refined copper production was negatively affected by the same factors that led to the fall in mine output (see paragraph 13).

46. As was the case at the mining level, the largest additions to refined copper production capacity are coming from Chile. They will consist mainly of the commissioning and expansion of large mines whose output will be processed through the SX-EW route to produce high-grade cathodes. As for the largest increases in refining copper production capacity in other countries, they will consist mostly of new refineries operating with conventional fire-refining and electrolytic refining technology. Such plans are being (or will be) implemented in countries that already are producers of refined metal (India, United States, Mexico, China, Republic of Korea, Zaire, Peru) and in countries which at present do not have any operating refinery (Indonesia, Saudi Arabia, Thailand) (table 13).

B. Trade

47. The bulk (62%) of international trade in unwrought copper is carried out in refined metal form. The share of world refined production that enters international trade is 40% (table 5). This means that more than half of world output of the metal is consumed domestically, which partly reflects the historical tendency for a larger part of the refined production capacity to be located close to consuming markets and not necessarily in mining countries. However, the portion of world refined copper production that is exported grew slightly in the 1990s. The reason was the growth of SX-EW production in some large exporting countries (mainly Chile and, to a lesser extent, Mexico, Peru and Australia). This process implies the production of refined copper at the mining site itself. Thus, most of the mine production processed though this route enters international trade as refined copper, rather than as concentrates or anodes/blister.

48. Most world exports of refined copper is controlled by countries with large integrated operations from the mining stage to the refining stage but low domestic consumption of the metal (Chile, Zambia, Canada, Peru) (table 14). In 1978 Chile displaced Zambia as the largest exporter of refined copper and it has increased its lead ever since. Additionally, the CIS and Poland in 1991-93 became the fourth and fifth largest exporting countries, as domestic and/or Eastern European demand for the output of their integrated operations fell steeply. Since the decrease in production was not as sharp as the fall of consumption, this left significant amounts to be exported to "Western" markets. The combined exports of both countries reached 502 ktpy in the early 1990s, while they had averaged 261 ktpy in 1981-1983.

49. By the end of the century, Latin America is bound to continue being the largest refined copper exporting region, thanks to the fact that refining capacity is likely to largely exceed domestic consumption in Chile and, to a lesser extent, Mexico and Peru. Another group of countries that should continue being major exporters of the red metal are the largest producers of the commodity in Eastern Europe, since only a modest rebound in domestic demand is foreseen for the Russian Federation, Poland and Kazakstan (table 14).

Table 14

Largest exporters of refined copper

(annual average quantity in thousand tons; share in percentage)

Major exporters, 1991 - 1993			Major potential exporters, 2000[a]		
Country/area	**quantity**	**share**	**Country/area**	**quantity**	**share**
Chile	1187.4	28.2	Chile	2268	37.8
Zambia	412.3	9.8	Russian Fed.	426	7.1
Canada	390.9	9.3	Mexico	426	7.1
CIS	261.0	6.2	Canada	386	6.4
Poland	240.7	5.7	Zambia	346	5.8
United States	232.7	5.5	Peru	323	5.4
Peru	222.0	5.3	India	217	3.6
Belgium	185.3	4.4	Poland	207	3.5
Australia	172.2	4.1	Zaire	182	3.0
Philippines	111.4	2.6	Kazakstan	171	2.9
Total above	3415.9	81.0	Total above	4952	82.5
Memo item:			*Memo item:*		
EU - 15	515.7	12.2	EU - 15	138	2.3
WORLD	**4216.2**	**100.0**	**WORLD**	**6000**	**100.0**

Source: UNCTAD

General note: for explanation of methodology used, see notes on page 5

a - Difference between projected domestic refining capacity (including high-grade SX-EW) and projected refined copper consumption.

50. As in the case of concentrates, the main markets for refined copper are Western Europe and the developed and rapidly industrialising countries of South and East Asia (table 15). The former accounts for half of total world imports of refined metal and the latter, for one third (including Japan). Trade data show the sharp difference between Japan and the EU, the two major import markets for unwrought copper. In the former, two thirds of Japanese imports of unwrought copper consist of concentrates which are processed domestically, with less then one third consisting of refined metal. In the Union, by contrast, over 75% of total unwrought copper imports are made up of refined copper, while the balance consists of concentrates and unrefined metal. This difference reflects both the structure of these importers' respective metallurgical and semifabricating industries and the different tariff structure applied by them.

51. The United States, on the other hand, is a minor net importer of refined copper, since the bulk of its demand for the metal is supplied by domestic production.

52. Projections show that the EU is likely to remain the largest market for refined copper by the end of the century, alhtough its share of total import demand is bound to fall marginally. The most dynamic growth markets should be the East Asian countries (table 15). Taiwan Province of China has no plans to build new metallurgical plants in the coming years and therefore will have to rely on imports of refined metal for the rapidly growing demand of its semifabricating industry. In other countries (Republic of Korea, China, Thailand, Indonesia), although there are plans to expand significantly or establish large new smelting/refining capacity, this expansion is likely to be outpaced by consumption growth.

Table 15

Largest importers of refined copper

(annual average quantity in thousand tons; share in percentage)

Major importers, 1991 - 1993			Major potential importers, 2000[a]		
Country/area	**quantity**	**share**	**Country/area**	**quantity**	**share**
Germany	571.1	12.9	Taiwan PC	1278.5	21.3
Japan	462.2	10.4	China	677.2	11.3
France	444.1	10.0	France	655.0	10.9
Taiwan PC	439.5	9.9	Germany	643.1	10.7
Italy	438.4	9.9	Korea, Rep. of	536.9	8.9
United States	318.9	7.2	Italy	505.5	8.4
United Kingdom	302.4	6.8	United Kingdom	448.5	7.5
Belgium	212.0	4.8	Thailand	256.2	4.3
China	211.1	4.8	Malaysia	243.8	4.1
Korea, Rep.of	164.1	3.7	Saudi Arabia	117.8	2.0
Total above	3563.8	80.4	Total above	5362.4	89.4
Memo item:			*Memo item:*		
EU - 15	2180.2	49.2	EU - 15	2589.0	43.2
WORLD	**4431.8**	**100.0**	**WORLD**	**6000.0**	**100.0**

Source: UNCTAD

General note: for explanation of methodology used, see notes on page 5

a - Difference between projected refined copper consumption and projected domestic refining capacity (including high-grade SX-EW).

C. Tariffs

1. Before the Uruguay Round

53. Tariffs levied by industrialized countries on imports of refined copper vary considerably among different markets. At the lower end are the European Union and Canada, which allow duty-free imports (table 16). The European Union's refined copper production meets only half of the requirements of the domestic copper semifabricating industry (the world's largest). The balance has to be supplied by imports, which explains the zero tariff applied to them. Canada, by contrast, has a medium-sized semifabricating industry which absorbs less than one third of domestic refined metal production, while the balance is exported. In other words, the country does not import this commodity.

54. Imports of refined copper into Japan, by contrast, are subject to the following specific tariffs, unless they benefit from GSP treatment:

- ¥ 15/kg, if the copper price is less than or equal to ¥ 485/kg;
- ¥ 10/kg , if the copper price is within the ¥ 485/kg - ¥ 500/kg range;
- no levy is applied if the copper price is above ¥ 500/kg.

55. The *ad-valorem* equivalent tariff increases when copper prices fall or, alternatively, when the yen appreciates against the U.S. dollar (since prices for internationally traded copper are set in U.S. dollars). Thus, on average, neither the zero tariff nor the lower tariff would ever have applied since 1987 for countries not beneficiating from GSP treatment (considering average yearly copper prices). On the contrary, *ad-valorem*

equivalent tariffs have varied from 3.9% in 1990 to 7.1% in 1993. This puts the Japanese tariff at the higher end of the range applied by the 10 largest importing markets (table 16). The above-mentioned levies, however, are the result of a temporary reduction relatively to the rate previously bound under the Tokyo Round of trade negotiations (¥ 21/kg). They are a barrier to imports not beneficiating from GSP treatment. These consist of all imports originating from developed countries (notably United States and Australia, which rank among the five largest suppliers of refined metal to the Japanese market) and the part of imports supplied by developing countries that does not receive the GSP preference.

56. Japanese imports of refined copper covered by the GSP are made duty-free. Although there is an extremely low ceiling to imports under the scheme (9,870 tons in 1994), it has traditionally been dodged, so that on average between 110 ktpy and 130 ktpy have entered the country duty-free in recent years[9], originating mainly from Chile and Zambia. This corresponds to approximately one fourth of the country's total imports of refined copper. Approximately half of developing countries' exports of refined copper to Japan benefit from duty-free treatment.

57. Imports of refined copper into the United States (the world's largest producer of the commodity) are subject to a 1% MFN tariff. Those that are covered by the GSP enjoy duty-free treatment. However, Chile (by far the world's largest exporter of refined copper) does not enjoy GSP preferential treatment for refined copper and the main foreign supplier to the United States market is Canada (which accounts for over 70% of United States imports of the commodity). Imports from Canada are made duty-free, thanks to the bilateral trade agreement between the two countries (which has become part of NAFTA).

58. Import tariffs in developing countries with a sizeable refined copper consumption vary considerably according to whether the country possesses domestic refining capacity or not. In those that do not and therefore are completely dependent on imports for their refined metal requirements, duties tend to be low: between 0% and 2% in Malaysia, Taiwan Province of China and Indonesia and 6% in Thailand.

59. Some other developing countries are important consumers of the metal and have operating copper refineries, but still have to resort to imports in order to meet their domestic demand. In the Republic of Korea, India, Brazil and China imports account for 26% to 45% of domestic consumption. Even though there is a national metallurgical industry that could be protected, import duties are not set at very high levels, given the requirements of the domestic semifabricating industry. Therefore, import tariffs tend to be higher than those imposed by the other group of developing countries, but are still below the 10% level. The exception once again is India, whose import tariff on refined copper is 65%, while total duties amount to 110% (i.e., the basic duty plus the 45% auxiliary duty of customs).

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[9] *Metal Bulletin Monthly Copper Supplement*, May 1994, p.21.

Table 16

Trade measures affecting imports of refined copper before and after the Uruguay Round

(percentage, except for specific tariffs)

Country/ customs area	Share of world imports (1991-93)	Pre-Uruguay Round						Uruguay Round	
		MFN range	MFN average	Total charges	NTM	GSP	LDC	Base rate of duty	Bound MFN rate
European Union	47.2	0 - 0	0	0	0	-	-	0	0
Japan	10.4	¥ 0 - 15/kg[g]	¥ 15/kg[h]	¥ 15/kg[h]	0	0[f]	-	¥ 21/kg	3[j]
Taiwan PC	9.9	0 - 0	0	0.5	0	-	-	n.a.[e]	n.a.[e]
United States	7.2	1 - 1	1	1	0	0[a]	-	1	1
China	4.8	5.5 - 5.5	5.5	5.5	0	-	-	6[i]	20[i]
Korea, Rep. of	3.7	9 - 9	9	9	0	-	-	20	10
Thailand	2.1	6 - 6	6	6	0	-	-	6	20
Malaysia	1.8	2 - 2	2	2	0	-	-	2	5
Saudi Arabia	1.7	12 - 12	12	12	0	-	-	n.a.[e]	n.a.[e]
Brazil	1.7	0 - 0	0	2.2	0	-	-	10	10
India	1.2	65 - 65	65	110	0	-	-	n.a.[c]	n.a.[c]
Indonesia	1.1	0 - 0	0	2.5	0	-	-		40[k]
Hong Kong	1.0	0 - 0	0	0	0	-	-	0	0
Philippines	0.3	10 - 10	10	19	0	-	-	n.a.[c]	n.a.[c]
Canada	0.3	0 - 0	0	0	0	0[b]	-	0	0
Mexico	0.2	10 - 10	10	13.7	0	-	-		35[k]
Switzerland	0.2	CHF 0.2/ 100 kg	CHF 0.2/ 100 kg	CHF 0.2/ 100 kg	0	0[d]	-	CHF 0.2/ 100 kg	CHF 0.14/ 100 kg
Singapore	0.2	0 - 0	0	0	0	-	-	20	10

Source: UNCTAD (Trade Analysis and Information System) and WTO

a - Excluding Chile; zero tariff applies also to Canada and Caribbean countries

b - Same rate for USA and Caribbean states

c - Item not included in country's UR schedule

d - Same rate for EEC and EFTA countries

e - Not a member of WTO

f - Quantitative restrictions may be applied

g - Depending on level of import price (temporary rate; GATT bound rate: ¥ 21/kg)

h - Most frequently applied rate (temporary rate; GATT bound rate: ¥ 21/kg)

i - Not a member of WTO. Tariffs mentioned are those included in schedule offered by China during UR negotiations

j - Rate likely to be most frequently applied. Imports will be duty-free if import price exceeds ¥ 500/kg

k - Uniform tariff ceiling

2. After the Uruguay Round

60. Import tariffs levied on refined copper by the European Union, Canada and the United States will not change as a result of the Uruguay Round. The rates included in the respective schedules are the same as those applied at present: 0% by the EU and Canada and 1% for the United States (table 16). The two former will apply the same treatment to unrefined and refined copper, while the United States tariff will be slightly higher at this stage of processing as compared to unrefined copper. As already mentioned, duty-free imports already apply to its main foreign supplier, Canada. The tariff will continue hurting basically Chilean exports, unless GSP treatment starts being applied to Chilean refined copper exports or the commodity is included in a possible future NAFTA-Chile free trade agreement.

61. The most contentious issue among industrialized countries regarding copper trade during the Uruguay Round was the Japanese import tariff on refined copper (which, as already mentioned, is considerably higher than that levied by other developed countries). The United States copper industry and government exerted strong pressure on Japan to accept a zero-for-zero agreement for copper (and other non-ferrous metals) whereby imports tariffs would be completely eliminated[10]. The proposal was rejected by Japan, mainly because of its intention to keep a certain level of tariff on its refined copper imports. As late as December 1993, when the Uruguay Round negotiations were coming to the end, the country offered to reduce its tariff from ¥ 15/kg to ¥ 9.7/kg. At mid-1995 prices and exchange rates, this would have corresponded to an *ad-valorem* equivalent of 3.9%. However, during periods of low prices, the equivalent of the tariff could reach a considerably higher level[11]. Under continuing strong pressure from the United States, in April 1994 Japan offered a tariff cut to 3% (the same as that applying to unrefined metal)[12]. The tariff was therefore included in the country's schedule of concessions.

62. The implementation of the UR agreement will benefit the main exporters of refined copper to Japan. It is the case, first of all, of the United States and Australia, which will see the imports duty halved, but also developing country exporters, since only approximately half of their exports *de facto* receive duty-free treatment under the GSP. For the latter, however, there could be a trade-off between the loss of preference margin and the lowering of the import tariff.

63. The reduction of the tariff, which is bound to be implemented only at the end of the 5-year term, will pose difficulties to the Japanese metallurgical industry. The latter is already under pressure from the appreciation of the yen *vis-à-vis* the United States dollar. On one hand, it causes the yen-denominated price of imports of refined copper to fall (despite the fact that the import tariff becomes higher). On the other hand, it reduces the revenue that Japanese smelters/refineries earn from the processing of concentrates on a toll basis (since treatment and refining charges are mostly denominated in United States dollars). The combination of the higher yen with the lower tariff is likely to strengthen the penetration of imports of refined copper in the Japanese market in the future.

64. Developing countries that are at present major importers of refined copper or which are growing markets for the commodity have generally bound their import tariffs at a higher level than their respective base rates of duty and also above their present import rates (table 16). Alternatively, they have not included this tariff

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[10] The bulk of the United States copper production is carried out in Western states, while consumption is concentrated on the Eastern coast. This has generated a pattern of trade by which United States copper producers export most of their output to Asian consuming markets, while Eastern coast consumers import refined copper from Canadian refineries (all of which are located in Eastern provinces). Thus, the Japanese market is potentially a major outlet for United States copper producers (Edelstein (1995), p.5).

[11] If copper prices were to fall to their 1993 level (US$ 1,913/ton) after the implementation of the new tariff, the *ad-valorem* equivalent would rise to 5.9%.

[12] Similarly to Japan's present tariff lines for refined copper, the country's UR schedule foresees duty-free imports (on an MFN basis) if the import price exceeds an extremely high level: ¥ 500/kg. However, this is highly unlikely to be applied in the future. Copper prices since 1988 have never exceeded ¥ 400/kg (as of mid-1995, they stood at ¥ 270/kg).

line in their UR schedules (e.g., India, Mexico, Indonesia). This is related to the fact that even though most of these countries have domestic refining capacity at present (China, Republic of Korea, Brazil, Philippines, India) or plan to build it in the coming years (Thailand, Indonesia), it will not be sufficient to meet domestic demand. Therefore, they will have to resort to imports of refined copper to supply the needs of their semifabricating industry. By binding their tariffs at high levels or not including them in their schedules, they have reserved themselves the right to adjust the level of possible tariff protection of their national metallurgical industry according to the developments of their domestic demand and production. The precise level of tariffs on refined copper imports to be applied will depend on the balance between the decision to offer some form of protection to the domestic metallurgical industry and the possible need to allow domestic output to be supplemented by imports, so as to meet the requirements of these countries' growing copper semifabricating industry. Moreover, import duties on refined copper will probably not be put at a very high level, because this would create a significant gap between domestic and international prices for a raw material that is essential to the economic growth of these countries. It would also penalize their export industries by increasing their raw materials cost.

VI. SCRAP

A. Trade

65. The major exporters of copper scrap are countries which have a high stock of scrap and an established system of scrap collection and marketing but at the same time do not have the corresponding recycling facilities (i.e., either smelters/refineries that process secondary raw material or semifabricating mills that directly remelt scrap which has not been previously smelted/refined). In turn, the stock of scrap is a function of past copper consumption (for old scrap) and of current production of semifabricates and manufactured products (for new scrap). The largest net exporters of copper and copper alloy scrap are United Kingdom and France, two countries which have large scrap stocks (thanks to past consumption), but where production of both primary and secondary copper is low as compared to other European producing countries. Other large net scrap exporters are major copper mining countries, like Canada, United States, Poland, CIS and Mexico (table 17).

66. Net imports of scrap are considerably more concentrated in a small number of countries than exports where they originate. While the ten largest net exporting countries of secondary raw material account for 71% of total net exports, the ten major net importers account for virtually all net imports (table 17). Net imports are highly concentrated on two regions: Western Europe and high-growth economies of East and South Asia. The European Union is the single largest importing market for copper and copper alloy scrap, absorbing almost half of world total exports. These data are bloated because they include EU intra-trade, but even excluding it the Union still is a net importer of scrap. There, it is used and an input both to semifabricating mills and to smelters/refineries. Western Europe is the region where production based on secondary sources is the highest as a share of total refined copper output: almost 50%.

Table 17

Largest copper and copper alloy scrap trading countries, 1991 - 1993

(annual average values in millions of dollars, share in percentage)

Major net importers			Major net exporters		
Country/area	**value**	**share of all net importing countries**	**Country/area**	**value**	**share of all net exporting countries**
Germany	290.0	16.5	United Kingdom	170.1	15.8
Korea, Rep.of	272.5	15.5	France	153.7	14.3
Italy	259.3	14.8	Canada	120.5	11.2
Japan	250.3	14.3	United States	65.1	6.1
Belgium	235.7	13.4	Poland	51.0	4.7
China	169.0	9.6	Singapore	50.9	4.7
India	106.8	6.1	Netherlands	41.3	3.8
Austria	64.6	3.7	CIS	40.3	3.7
Hong Kong	45.3	2.6	Mexico	36.7	3.4
Sweden	18.7	1.1	Frm.Czechoslovakia	36.0	3.3
Total above	1712.3	97.7	Total above	765.7	71.2
Memo item:					
EU - 12[a]	324.7	18.5			
All net importing countries	**1753.3**	**100.0**	**All net exporting countries**	**1076.1**	**100.0**

Source: UNCTAD

a - Net extra-EU imports

67. In Asia, Republic of Korea, Japan, China, India, Taiwan Province of China and Thailand together account for almost one third of total world imports of copper and copper alloy scrap. In the economies with a recent accelerated process of industrial growth, copper scrap is imported as a cheaper alternative to refined copper in meeting the metal requirement of the domestic semifabricating industries.

68. Tariffs imposed on trade of copper and copper alloy scrap are generally low (if not nil) and therefore will not be affected by the implementation of the Uruguay Round agreements (see below). The single factor that potentially can have the strongest impact on international trade in these products in the future is legal impediments that can impose strong restrictions on trade in scrap, as can be the case with the enforcement of the Basel Convention.

B. Tariffs

1. Before the Uruguay Round

69. Among idustrialized countries, imports of copper and copper alloy scrap are made duty-free in the European Union, United States and Japan, while they are subject to an average 4.2% duty in Canada (table 18).

70. Among the largest net importing markets in the developing world, copper and copper alloy scrap imports face higher tariffs: 2% in the Republic of Korea and 5.5% in China. While other markets allow duty-free imports (Taiwan Province of China and Brazil), the exception once again is India, where scrap has the same treatment as most unwrought copper products: an MFN rate of 65%, with total duties amounting to 110%.

2. After the Uruguay Round

71. Tariffs on imports of copper and copper alloy scrap will not change significantly as a result of the implementation of the UR agreements. They will remain unchanged at the zero level in the three main markets of the industrialized world: European Union, United States and Japan and will be lowered to 1.9% in Canada.

72. Among developing countries, the only major importing country which has committed itself to reduction of tariffs is the Republic of Korea (to a zero duty). All other major importing markets have either bound their tariffs above the present level (China in its offered schedule) or have not included the commodity in their schedules (India, Brazil) (table 18).

Table 18

Trade measures affecting imports of copper and copper alloy scrap before and after the Uruguay Round

(percentage, except for specific tariffs)

Country/ customs area	Share of world imports (1991 - 1993)[a]	Pre-Uruguay Round						Uruguay Round	
		MFN range	MFN average	Total charges	NTM	GSP	LDC	Base rate of duty avg	Bound MFN avg
European Union	48.8	0 - 0	0	0	0	-	-	0	0
Korea, Rep. of	9.1	2 - 2	2	2	0	-	-	10	0
United States	8.7	0 - 0	0	0	0	-	-	0	0
Japan	8.6	0 - 0	0	0	0	-	-	0	0
China	5.7	5.5 - 5.5	5.5	5.5	0	-	-	6[f]	20[f]
Hong Kong	3.9	0 - 0	0	0	0	-	-	0	0
India	3.5	65 - 65	65	110	0	-	-	n.a.[g]	n.a.[g]
Austria	2.8	0 - 0	0	0	0	-	-	0	0
Canada	1.6	0 - 8.8	4.2	4.2	0	0 - 6.5	0[c]	4.7	1.9
Sweden	1.5	0 - 0	0	0	0	-	-	0	0
Taiwan PC	1.4	0 - 0	0	0.5	100[b]	-	-	n.a.[g]	n.a.[g]
Singapore	0.8	0 - 0	0	0	0	-	-	20	10
Switzerland	0.5	CHF 0.2/ 100 kg	CHF 0.2/ 100 kg	CHF 0.2/ 100 kg	0	0[d]	-	CHF 0.13/ 100 kg	CHF 0.07/ 100 kg
Mexico	0.4	5 - 5	5	8.4	0	-	-		35[h]
Thailand	0.2	6 - 6	6	6	0	-	-	6	6
Brazil	0.2	0 - 0	0	2.2	0	-	-	n.a.[g]	n.a.[g]
Malaysia	0.1	2 - 2	2	2	0	-	-	2	5
Indonesia	0.1	5 - 5	5	7.5	0	-	-		40[h]
Phlippines	0	10 - 10	10	19	0	-	-	n.a.[g]	n.a.[g]

Source: UNCTAD (Trade Analysis and Information System), WTO and NRCan

a - Share in value of total world imports

b - Licence required and special entry procedures applied on two out of two national tariff lines

c - Same rate for USA and Caribbean states

d - Same rate for EEC and EFTA countries

e - Item not included in country's UR schedule

f - Not a member of WTO. Tariffs mentioned are those included in schedule offered by China during UR negotiations

g - Not a member of WTO

h - Uniform tariff ceiling

VII. SEMIFABRICATES

A. Production

73. Statistics on production of copper semifabricates are not as extensively available as those for production of unwrought copper, from concentrates to the refined metal stage. Even though they are reasonably accurate for industrialized countries, data for Eastern Europe and most developing countries are not available. In order to have a worldwide picture of copper and copper alloy semis production, refined copper consumption data can be used as a proxy, since virtually all refined copper consumption is accounted for by the production of semis. Moreover, in some large consuming countries refined metal consumption data are those actually reported by semis mills[13].

74. Consequently, the general lines of what has been said about the regional distribution and the trends of consumption of the metal (see chapter I) apply also to semis production. Semifabricating is still highly concentrated in developed countries, particularly in Western Europe (the largest producing region) and in North America. However, semis production expanded rapidly in developing Asia over the past 15 years, so that the region's output at present matches that of North America. On the other hand, it experienced a drastic fall in Eastern Europe after 1988 (table 1).

75. As for the future outlook for semis production, the most dynamic region is bound to continue being East and South Asia, which is projected to account for almost 60% of total world increase in semis production in the years to the end of the century (table 2). Semifabricators are also likely to raise output in the United States and Western Europe, but their production increase should amount to less than one fourth of total world expansion.

B. Trade

76. Available data indicate that the portion of copper and copper alloy semifabricates production that enters international trade (18%) is lower than that of concentrates (24%) and well below the share of refined copper that is internationally traded (40%) (table 5). This is a consequence of the fact that production of semis tends to be directed basically to domestic markets (see Annex). Whereas several mining countries have succeeded in processing a significant share of their mine output up to refined copper despite their limited domestic demand for the metal, the same is not true for the semifabricating level. Only in mining countries with a large domestic market does the semifabricating industry absorb most of domestic refined metal production (e.g., United States, China and, until recently, the Russian Federation). Where the domestic market is comparatively small, most of the refined metal output is exported without further processing. It is the case not only of developing countries like Chile, Zambia and Peru but also of developed nations like Canada and Australia. This explains why a much lower share of semis production is exported than that of refined copper. While in 1991-1993 4.4 million tons of refined metal were imported worldwide, the approximate copper content of semis imports was estimated at approximately 2 million tons (i.e., less than half).

77. International trade in semis is concentrated on three regional flows taking place in Europe, NAFTA countries and East Asia. Over half of the world total trade in these products is carried out in Europe, comprising mainly EU intra-trade, but also EFTA intra-trade, trade among these two groups[14] and among them and Eastern European countries and Turkey. Five out of the seven largest net semifabricates exporters are Western European countries: Germany, Belgium, France, Sweden and Finland account for more than half of the net exports of all net semis exporting countries (table 19).

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[13] There are some setbacks to the use of this proxy: i) it does not necessarily take into account the direct use of scrap by semifabricators; ii) it provides an estimate of the **copper** content of copper and copper alloy semis, whereas direct data include non-copper content of semis (nevertheless, copper is estimated to amount to more than 70% of the weight of copper alloy semis).

[14] Data showing these trade flows precede the accession of Austria, Finland and Sweden to the European Union. However, their entry should not have any indirect effect on these flows, since their exports to and imports from the Union already received duty-free treatment.

78. Trade in North America, on the other hand, consists mainly of exports from Canada and Mexico to the United States market. The latter country is the third largest importer of copper and copper alloy semis; in terms of net trade, it is a medium-sized net importer.

79. In East Asia, the largest net exporters are Japan and, to a lesser extent, Taiwan Province of China and Republic of Korea (table 19). China is the world's largest net importer of copper and copper alloy semis. Its imports soared from 38 kt in 1990 to 156 kt in 1992; two years later, they had almost doubled to 283 kt. Table 19 shows Hong Kong as the largest net importer of these products; however, most of the territory's imports are not destined to domestic consumption, but are re-exported to China. Other countries of the region have also experienced a rapid growth in their imports of semis, mainly Singapore[15], Malaysia, Thailand (all of them are among the major net importers of semis); the same holds true for India.

Table 19

Largest copper and copper alloy semifabricates trading countries, 1991 - 1993

(annual average value in millions of dollars, share in percentage)

Major net importers			Major net exporters		
Country/area	**value**	**share of all net importing countries**	**Country/area**	**value**	**share of all net exporting countries**
Hong Kong	589.5	15.7	Germany	1095.0	26.4
China	254.1	6.8	Japan	893.4	21.5
Spain	245.0	6.5	Belgium	664.5	16.0
Singapore	235.2	6.3	Taiwan PC	454.5	11.0
Switzerland	195.8	5.2	France	255.5	6.2
Austria	183.8	4.9	Sweden	192.8	4.6
Netherlands	157.8	4.2	Finland	168.0	4.0
Malaysia	150.5	4.0	Poland	136.3	3.3
Thailand	142.8	3.8	Chile	73.7	1.8
Denmark	113.3	3.0	Australia	52.3	1.3
Total above	2267.6	60.3	Total above	3986.1	96.1
			Memo item:		
			EU - 12[a]	1208.1	29.1
All net importing countries	**3760.1**	**100.0**	**All net exporting countries**	**4149.4**	**100.0**

Source: UNCTAD

a - Net extra-EU exports

80. Given that manufacturing industry in most developing countries is not large enough to allow economies of scale necessary to the establishment of national copper semifabricating industries, they largely rely on imports for the supply of copper and copper alloy semis. Therefore, developing countries are net importers of these products, acquiring them mainly from industrialized countries (which are net exporters) or from the relatively more industrialized developing countries. In 1991-1993 yearly net exports of developed countries amounted to US$ 1.7 billion, while net imports by developing countries averaged US$ 1.5 billion.

C. Tariffs

1. Before the Uruguay Round

81. Trade barriers applied to copper and copper alloy semifabricates in the main importing markets are quite different from those prevailing at the lower stages of processing (table 20). This tariff escalation means that the effective tariff rate on copper and copper alloys semis is considerably higher than those applied to unwrought copper products. Both industrialized and developing countries thereby offer a certain degree of protection to their domestic semifabricating industries, while favouring imports of the latter's needed raw material (i.e., unwrought copper and scrap). It is the case first of all of countries that have semifabricating mills

[15] As in the case of Hong Kong, the bulk of Singaporean imports do not meet domestic demand, but are re-exported, mainly to other Asean countries.

but no copper refineries, like Taiwan Province of China, Saudi Arabia, Thailand, Malaysia and Indonesia. The same policies are applied by countries that have copper refineries but resort to imports of the metal because the demand from semis mills exceeds domestic refining capacity. Also in this case refined copper is subject to lower import tariffs than semis, as happens in the major developed country markets (particularly the EU) and, among developing countries, in China, Republic of Korea and Brazil.

82. Semifabricating is the only stage of the copper processing chain before manufactures and downstream products where a non-tariff measure is applied by an industrialized country (the United States), though this has a limited incidence. Table 19 shows average tariffs for imports of the most widely traded categories of copper and copper alloy semis: wire; plates, sheets and strips; tubes and pipes; bars, rods and profiles; foil. Together they account for almost 80% of world trade in semis.

83. The European Union, being both the largest producing region of semis and the major importing market for these commodities, applies tariffs of 6-6.5% on imports. This is in sharp contrast with duty-free treatment of unwrought copper, from the concentrates to the refined metal stage. Over half of its imports of semis in 1992 from outside the Union originated from EFTA countries, whose exports enjoy duty-free treatment in the EU. The United States accounted for 11% of the Union's total imports in 1992. GSP beneficiaries enjoy the same preference as EFTA countries (zero tariff), but ceilings apply to their exports. The major suppliers in this group are Turkey[16], China, India and Taiwan Province of China. ACP countries also benefit from duty-free treatment, but they are not exporters of these products and in most cases they do not produce them.

84. The United States, which comes second after the European Union both as producer and as an import market, imposes comparatively lower tariff barriers to imports. They range from 1.7% to 3.9% for the main product categories; moreover, the country grants duty-free access to countries benefiting from preferential treatment under its GSP scheme. Even though quantitative restrictions to GSP imports have a limited incidence, the major exporters to the United States market do not benefit from the scheme. They are either industrialized countries (Japan, Germany) and Taiwan Province of China (which is not eligible for GSP treatment in the United States) or benefit from tariff preferences (Canada). The former countries have a market share of 38% of United States imports of semis, while Canada accounts for 15% of the total.

85. The next largest importer of copper semis among industrialized countries is Switzerland. In 1992, its MFN tariffs corresponded to an *ad valorem* equivalent ranging from 2% to 13.7%. However, imports from the EU and other EFTA countries enjoy duty-free treatment and these countries account for virtually all foreign supplies of copper and copper alloy semis to Switzerland. This country grants the same treatment (i.e., zero tariff) to the beneficiaries of its GSP scheme and to LDCs, but, as mentioned, this has not had any significant impact on the country's imports, since beneficiary countries have not become important suppliers to the Swiss market.

86. Still among industrialized countries, Canadian MFN tariffs for major semis groups range from 6.3% to 7.4%. GSP beneficiary countries exports enjoy preferential treatment, with tariffs ranging from 0% to 6.5%, whereas exports of semis from least developed countries are granted duty-free access. However, none of the latter have significant trade effects, as the bulk (89%) of Canadian imports of semis originate in the United States, which enjoys preferential treatment. United States semis exports to Canada are subject to tariffs that are frequently lower than the ones applied to imports under the GSP. As for LDCs, none of them is a significant exporter of copper semis. Austria before its accession to the EU applied MFN rates ranging from 5% to 7% to imports of semis and granted preferential treatment to GSP beneficiary countries (tariffs between 2.5% and 3.5%) and to LDCs (duty-free access). However, its imports from these countries are insignificant. All its major foreign suppliers of copper semis are Western European countries, which already enjoyed duty-free exports for most semis categories under EFTA and EFTA-EU agreements.

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[16] Turkey was a beneficiary of the GSP of the European Union until the end of 1995. Since 1 January 1996, trade between this country and the Union has been regulated by the custom union that came into effect on that date.

Table 20

Trade measures affecting imports of copper and copper alloy semifabricates before and after the Uruguay Round

(percentage, except for specific rates)

Country/ customs area	Share of world exports (1991-93)[a]	Articles	Pre-Uruguay Round						Uruguay Round	
			MFN range	MFN average	Total charges	NTM	GSP	LDC	Base rate of duty avg	Bound MFN avg
European Union	44.4	Copper wire	6 - 6	6	6	0	0[e]	-	6	4.8
		Copper plates, sheets and strip	6 - 6	6	6	0	0[e]	-	6	4.8
		Copper tubes and pipes	6 - 6	6	6	0	0[e]	0	6	4.8
		Copper bars, rods and profiles	6 - 6	6	6	0	0[e]	-	6	4.8
		Copper foil	6.5 - 6.5	6.5	6.5	0	0[e]	-	6.5	5.2
United States	6.9	Copper wire	1 - 4	3.8	3.8	20[d]	0	-	3.7	2.8
		Copper plates, sheets and strip	1 - 7	3.7	3.7	25[b]	0	-	3.8	2.4
		Copper tubes and pipes	1 - 5	3.6	3.6	0	0	-	3.3	2.3
		Copper bars, rods and profiles	1 - 6	3.9	3.9	12[c]	0[e]	-	4.1	2.4
		Copper foil	1 - 5	1.7	1.7	0	0	-	2.1	1.6
Hong Kong	6.3	Copper wire	0 - 0	0	0	0	-	-	0	0
		Copper plates, sheets and strip	0 - 0	0	0	0	-	-	0	0
		Copper tubes and pipes	0 - 0	0	0	0	-	-	n.a.[h]	n.a.[h]
		Copper bars, rods and profiles	0 - 0	0	0	0	-	-	0	0
		Copper foil	0 - 0	0	0	0	-	-	0	0
China	3.6	Copper wire	9 - 28	15.2	15.2	0	-	-	15.6[f]	23[f]
		Copper plates, sheets and strip	9 - 28	15.1	15.1	0	-	-	15.4[f]	21.9[f]
		Copper tubes and pipes	9 - 28	16.8	16.8	0	-	-	17.3[f]	23.8[f]
		Copper bars, rods and profiles	9 - 28	16.8	16.8	0	-	-	13.8[f]	19[f]
		Copper foil	9 - 28	15.3	15.3	0	-	-	12[f]	16.7[f]
Singapore	3.3	Copper wire	0 - 0	0	0	0	-	-	20	10
		Copper plates, sheets and strip	0 - 0	0	0	0	-	-	20	10
		Copper tubes and pipes	0 - 0	0	0	0	-	-	20	10
		Copper bars, rods and profiles	0 - 0	0	0	0	-	-	20	10
		Copper foil	0 - 0	0	0	0	-	-	20	10
Switzerland	3.2	Copper wire	CHF 13-29/ 100 kg	CHF 22/ 100 kg	CHF 22/ 100 kg	0	0	0	CHF 13.7/ 100 kg	CHF 9.4/ 100 kg
		Copper plates, sheets and strip	CHF 14-77/ 100 kg	CHF 43/ 100 kg	CHF 43/ 100 kg	0	0	0	CHF 42.9/ 100 kg	CHF 27.8/ 100 kg
		Copper tubes and pipes	CHF 16-19/ 100 kg	CHF 18/ 100 kg	CHF 18/ 100 kg	0	0	0	CHF 17.5/ 100 kg	CHF 13/ 100 kg
		Copper bars, rods and profiles	CHF 11-26/ 100 kg	CHF 16/ 100 kg	CHF 16/ 100 kg	0	0	0	CHF 15.5/ 100 kg	CHF 10.6/ 100 kg
		Copper foil	CHF 24-55/ 100 kg	CHF 45/ 100 kg	CHF 45/ 100 kg	0	0	0	CHF 44.7/ 100 kg	CHF 30.8/ 100 kg
Austria	3.1	Copper wire	5 - 5	5	5	0	2.5	0	5	4.4
		Copper plates, sheets and strip	5 - 5	5	5	0	2.5	0	5	4.4
		Copper tubes and pipes	7 - 7	7	7	0	3.5	0	7	4.7
		Copper bars, rods and profiles	5 - 5	5	5	0	2.5	0	5	4.4
		Copper foil	6 - 7	6.5	6.5	0	3.5	0	6.5	4.8
Malaysia	2.5	Copper wire	2 - 25	11.2	11.2	0	-	-	25	30
		Copper plates, sheets and strip	2 - 2	2	2	0	-	-	2	30
		Copper tubes and pipes	2 - 2	2	9.5	0	-	-	n.a.[h]	n.a.[h]
		Copper bars, rods and profiles	2 - 18	3.3	5.4	0	-	-	2.7	6.7
		Copper foil	2 - 2	2	2	0	-	-	n.a.[h]	n.a.[h]

Table 20 (continued)

Trade measures affecting imports of copper and copper alloy semifabricates before and after the Uruguay Round

(percentage, except for specific rates)

Country/ customs area	Share of world exports (1991-93)[a]	Articles	Pre-Uruguay Round						Uruguay Round	
			MFN range	MFN average	Total charges	NTM	GSP	LDC	Base rate of duty avg	Bound MFN avg
Canada	2.3	Copper wire	4 - 10	7.4	7.4	0	0 - 6.5	0[f]	7.4	2.9
		Copper plates, sheets and strip	4 - 10	7.2	7.2	0	0 - 6.5	0[f]	7.1	2.9
		Copper tubes and pipes	0 - 10	6.6	6.6	0	0 - 6.5	0[f]	6.4	2.5
		Copper bars, rods and profiles	4 - 10	6.3	6.3	0	0 - 6.5	0[f]	6.3	2.9
		Copper foil	4 - 10	7.2	7.2	0	0 - 6.5	0[f]	7.2	2.9
Rep. of Korea	2	Copper wire	11 - 11	11	11	0	-	-	20	10
		Copper plates, sheets and strip	10 - 11	10.5	10.5	0	-	-	15	7.5
		Copper tubes and pipes	11 - 11	11	11	0	-	-	25	13
		Copper bars, rods and profiles	11 - 11	11	11	0	-	-	25	13
		Copper foil	11 - 11	11	11	0	-	-	21.7	11
Japan	1.6	Copper wire	4.6 - 5.8[m]	5.6	5.6[m]	0	0[i]	-	6.9	3
		Copper plates, sheets and strip	4.6 - 5.2[n]	4.9	4.9[n]	0	0[i]	-	6.1	3
		Copper tubes and pipes	5.2 - 6.6[o]	5.5	5.5[o]	0	0[i]	-	6.9	3
		Copper bars, rods and profiles	4.6 - 5.8[p]	5.5	5.5[p]	0	0[i]	-	6.9	3
		Copper foil	4.8 - 5.2[q]	4.9[q]	4.9[q]	0	0[i]	-	6.1	3
Thailand	1.5	Copper wire	17 - 17	17	17	0	-	-	17	17
		Copper plates, sheets and strip	17 - 17	17	17	0	-	-	17	17
		Copper tubes and pipes	17 - 17	17	17	0	-	-	n.a.[r]	n.a.[r]
		Copper bars, rods and profiles	17 - 17	17	17	0	-	-	17	18.5
		Copper foil	17 - 25	21	21	0	-	-	21	18.5
Mexico	1.4	Copper wire	10 - 15	11.8	15.6	0	-	-		35[s]
		Copper plates, sheets and strip	10 - 10	10	13.7	0	-	-		35[s]
		Copper tubes and pipes	10 - 15	14	17.9	0	-	-		35[s]
		Copper bars, rods and profiles	10 - 15	14.6	18.5	0	-	-		35[s]
		Copper foil	10 - 10	10	13.7	0	-	-		35[s]
India	1.0	Copper wire	65 - 65	65	110	0	-	-	n.a.[t]	n.a.[t]
		Copper plates, sheets and strip	65 - 65	65	110	25[u]	-	-	n.a.[t]	n.a.[t]
		Copper tubes and pipes	65 - 65	65	110	0	-	-	n.a.[t]	n.a.[t]
		Copper bars, rods and profiles	65 - 65	65	110	0	-	-	n.a.[t]	n.a.[t]
		Copper foil	65 - 65	65	110	0	-	-	n.a.[t]	n.a.[t]
Taiwan PC	0.9	Copper wire	3 - 5	4.2	4.7	0	-	-	n.a.[v]	n.a.[v]
		Copper plates, sheets and strip	4 - 5	4.6	5.1	0	-	-	n.a.[v]	n.a.[v]
		Copper tubes and pipes	5 - 5	5	5.5	0	-	-	n.a.[v]	n.a.[v]
		Copper bars, rods and profiles	3 - 5	4.3	4.8	0	-	-	n.a.[v]	n.a.[v]
		Copper foil	5 - 10	7.5	8	0	-	-	n.a.[v]	n.a.[v]
Indonesia	0.6	Copper wire	5 - 20	12	14.5	0	-	-		40[s]
		Copper plates, sheets and strip	5 - 5	5	7.5	0	-	-		40[s]
		Copper tubes and pipes	5 - 10	7.5	10	0	-	-		40[s]
		Copper bars, rods and profiles	5 - 15	10	12.5	0	-	-		40[s]
		Copper foil	0 - 5	4.4	6.9	0	-	-		40[s]

Table 20 (continued)

Trade measures affecting imports of copper and copper alloy semifabricates before and after the Uruguay Round

(percentage, except for specific rates)

Country/ customs area	Share of world exports (1991-93)[d]	Articles	Pre-Uruguay Round						Uruguay Round	
			MFN range	MFN average	Total charges	NTM	GSP	LDC	Base rate of duty avg	Bound MFN avg
Brazil	0.5	Copper wire	10 - 10	10	12.2	0	-	-	50	35
		Copper plates, sheets and strip	10 - 10	10	12.2	0	-	-	54.4	30.3
		Copper tubes and pipes	10 - 10	10	12.2	0	-	-	65	31.7
		Copper bars, rods and profiles	10 - 10	10	12.2	0	-	-	57.5	33.5
		Copper foil	10 - 10	10	12.2	0	-	-	45	32
Philippines	0.2	Copper wire	20 - 20	20	29	0	-	-	25	30
		Copper plates, sheets and strip	20 - 20	20	29	0	-	-	20	28.8
		Copper tubes and pipes	20 - 20	20	29	0	-	-	30	30
		Copper bars, rods and profiles	20 - 20	20	29	0	-	-	25	30
		Copper foil	20 - 20	20	29	0	-	-	20	30

Source: UNCTAD (Trade Analysis and Information System) and WTO

a - Antidumping and countervailing duties against South Africa and New Zealand on 1 out of 8 national tariff lines

b - Antidumping and countervailing duties against Brazil, Canada, Korea Rep., France on 2 out of 17 national tariff lines

c - Antidumping and countervailing duties against South Africa and New Zealand on 2 out of 10 national tariff lines

d - Share in value of total world imports

e - Same rate for EFTA and ACP countries

f - Same rate for Caribbean countries

g - Negative list applied to part of tariff line

h - Item not included in country's/customs area's UR schedule

i - Not a member of WTO

j - Quantitative restrictions may be applied

k - Reduced competitive limits applied to imports from Brazil

l - Same rate for EEC and EFTA countries

m - Temporary rates. GATT-bound rate range: 5.8 - 7.2

n - Temporary rates. GATT-bound rate range: 5.8 - 6.5

o - Temporary rates. GATT-bound rate range: 6.5 - 8.2

p - Temporary rates. GATT-bound rate range: 5.8 - 7.2

q - Temporary rates. GATT-bound rate range: 6 - 6.5

r - Not a member of WTO. Tariffs mentioned are those included in schedule offered by China during UR negotiations

s - Uniform tariff ceiling

87. The countries that have the largest semifabricating capacity in the developing world levy imports in the 10%-20% range, as is the case of China, Republic of Korea, Brazil, Mexico and Thailand (table 19). Among the major developing countries producers of semis, the exceptions are Taiwan Province of China and India. The former is a net exporter of these products and has lower import tariffs, ranging from 4.2% to 7.5%, while India levies import duties of 65% and total charges of 110% (the same rates apply to refined copper). Other

developing countries which have a smaller semis industry and are importers of these products have import tariffs generally below 10%, as is the case of Malaysia and Indonesia. Singapore and Hong Kong allow duty-free entry of imports, but, as already mentioned, they consist largely of transit trade.

2. After the Uruguay Round

88. Once the commitments undertaken during the UR are implemented, there will be a reduction in MFN import tariffs of industrialized countries on all major categories of semis, but at different rates (table 19). The average cut in the European Union will be of 1.2 percentage points, or 20% of the present rate. After the implementation of the tariff schedule, its average 4.9% duty will be the highest among industrialized countries. In the second largest importing market, the United States, the average tariff reduction of 1 percentage point corresponds to a 30% cut. The future tariff level will be the lowest among industrialized countries.

89. Canada and Japan, whose imports amount to only 7% of the world total, will cut their import duties by an average 4.1 and 2.3 percentage points, respectively. These will be the largest relative cuts, since they amount to 59% and 43% of present tariffs, respectively. After implementation of the tariff schedules, import duties will be less than or equal to 3% in the United States, Canada and Japan and a higher 4.9% in the EU.

90. These tariff changes will not affect intra-Western European trade directly, since imports are already made duty-free among EU and EFTA countries. Nor will they have any direct impact on trade between the EU and Central European countries, since the trade agreements with the latter provide for duty-free imports or for tariffs lower than those bound in the UR schedules. Before the final deadline for the implementation of these schedules, the remaining tariffs on Central European exports of copper semis will be abolished, which should benefit mainly Polish exports to the Union. Additionally, Turkey will continue benefiting from duty-free access to the EU market, in the context of its customs union with the EU. Duty-free access for countries which have a supply capacity in copper and copper alloy semis and which are geographically close to the EU is likely to have a stronger effect in fostering regional trade than the reduction of the MFN rate. This is all the more so because the EU's import tariff will be the highest among developed countries. This will reduce the potential benefit that other foreign suppliers to the EU market (particularly United States, Japan and developing countries not benefitting from GSP treatment) can derive from the MFN tariff cut.

91. Another Western European country, Switzerland, has also pledged to reduce its import levies on semis by an average 40%, but this is unlikely to alter foreign trade in these products significantly, for its major partners are other Western European countries geographically close to it. Their products are imported duty-free by Switzerland (as already mentioned).

92. As for the second largest market for copper and copper alloy semis, the United States, tariff cuts will mean the erosion of preference margins enjoyed by GSP countries (like India) and by Canada. On the other hand, it will benefit foreign suppliers that already account for the bulk of the U.S. import market without having preferential treatment, Japan, Western Europe and Taiwan Province of China.

93. Among developing countries, the major importers have not committed themselves to reducing import tariffs on copper and copper alloy semis as part of their concession in the framework of the UR. This is particularly true of those countries that are significant producers of these items. Governments either have not included these products in their schedules (Mexico, India) or have bound their import duties at a level higher than or equal to their present rates. Republic of Korea and Thailand have pledged to keep their import duties at the same level, but they are rather exceptional cases. China, the largest semis imports in the developing world, has MFN bound rates for the main categories of semis that average 18.3% in the schedule it offered during the UR, while the present level is 15.8%. In Singapore, the corresponding rates are 10% and 0%, respectively, and in Malaysia, 22.2% and 4.1%. Brazil and Philippines also have higher bound rates than their present duties. This reflects these countries' intention of fostering the development of a domestic semifabricating industry, in order to supply at least part of the growing domestic market for these products or, in some cases, to develop production for exports. These countries are not likely to raise their imports duties from present levels significantly, but neither will they probably reduce them.

Table 21

Tariff escalation in copper trade before and after the Uruguay Round

(MFN average, percentage)

Country/ customs area	Processing stage	Pre-UR (A)	Post-UR (B)	Tariff cut (A) - (B)
European Union	concentrates	0	0	0
	unrefined	0	0	0
	refined	0	0	0
	semis	6.1	4.9	1.2
Japan	concentrates	0	0	0
	unrefined	6[c]	3	3
	refined	5.3[c]	3	2.3
	semis	5.3	3	2.3
United States	concentrates	0[a]	0[a]	0[a]
	unrefined	1	0	1
	refined	1	1	0
	semis	3.3	2.3	1
Canada	concentrates	0	0	0
	unrefined	0	0	0
	refined	0	0	0
	semis	6.9	2.8	4.1
China	concentrates	0	0[e]	0[e]
	unrefined	6	5[f]	1[f]
	refined	5.5	5.5[e]	0[e]
	semis	15.8	15.8[e]	0[e]
Taiwan PC	concentrates	0	0[b]	0[b]
	unrefined	0	0[b]	0[b]
	refined	0	0[b]	0[b]
	semis	5.1	5.1[b]	0[b]
Korea, Rep. of	concentrates	1	1	0
	unrefined	4	0	4
	refined	9	9[g]	0[g]
	semis	10.9	10.9	0
India	concentrates	45	40	5
	unrefined	65	65[d]	0[d]
	refined	65	65[d]	0[d]
	semis	65	65[d]	0[d]
Brazil	concentrates	0	0[d]	0[d]
	unrefined	0	0[g]	0[g]
	refined	0	0[g]	0[g]
	semis	10	10[g]	0[g]

Source: UNCTAD (Trade Analysis and Information System) and WTO

a - Supposing no lead content in copper concentrate

b - Not a member of WTO; present tariff is indicated (i.e., suppposing tariff will not be raised although country/customs area can do it)

c - Ad-valorem equivalent based on 1991-93 import prices and exchange rates

d - Item not included in country's UR schedule (i.e., supposing tariff will not be raised although country can do it)

e - Tariff included in schedule offered by China during UR negotiations is higher, but present tariff is indicated (i.e., supposes tariff will not be raised although country can do it)

f - Supposes country will apply tariff included in schedule offered by China during UR negotiations

g - Tariff included in country's schedule is higher, but present tariff is indicated (i.e., supposes tariff will not be raised although country can do it)

VIII. CONSEQUENCES OF THE URUGUAY ROUND

94. In broad lines, the implementation of the agreements resulting from the Uruguay Round will not have a strong direct impact on international trade in copper from the mining to semifabricating stage. The main reasons for this are that, on the side of industrialized countries, tariffs will either remain unchanged at low levels or be marginally reduced. On the part of developing countries that are or may become large importing markets for these commodities, governments either have not bound their national tariffs on copper or have bound them at higher levels than applied rates. Both alternatives leave them the option to change duties in the future.

95. With regard to trade in **unwrought copper**, industrialized countries at present apply duty-free treatment or low rates for products from concentrates to refined metal and have committed themselves to continue doing so. The exception to this picture is Japan. The halving of its tariffs on unrefined and refined copper may further weaken the competitive position of its metallurgical industry and is likely to cause imports of refined copper to increase once the tariff cut has been implemented. This would benefit mainly the exports from Chile and the United States.

96. The difficulties encountered by the Japanese metallurgical industry and the increased penetration of its domestic market by imported refined copper are likely to reinforce the trend of Japanese companies to invest in smelting/refining operations abroad, so as to avoid the difficulties arising from having their operations located in Japan. Japanese companies have increased their involvement in direct ownership of mining operations abroad since the 1980s[17]. More recently, they have started strengthening their direct investment in metallurgical operations overseas[18]. While the first trend is related to the wish to have a direct influence on the sourcing of concentrates, the move to invest in foreign metallurgical plants is spurred mainly by the continued difficulties faced by domestic operations. Since these may deepen with the increase in foreign competition, the trend towards the internationalization of the Japanese metallurgical industry is likely to be strengthened in the early years of the 21st century, when the cut in the tariff on refined copper will have been implemented.

97. Developing countries whose semifabricating industry is generating increasing demand for refined copper (and scrap) and which at the same time will expand or install smelting/refining capacity are likely to offer some form of protection to their domestic metallurgical industries. This can be done by allowing duty-free imports of concentrates or by levying low tariffs on them, as opposed to higher tariffs on refined copper (and, possibly, on unrefined metal). This policy is likely to be adopted by China, India, Republic of Korea, Saudi Arabia, Thailand and Brazil. However, in most of these countries the metallurgical sector will not be able to meet growing domestic demand for refined metal. Therefore, demand for imported refined copper will also expand. Although governments will probably offer some form of protection to national metallurgical industries, tariffs on refined copper imports are unlikely to be very high, because this would damage the competitive position of the national semifabricating industries. Moreover, it would have as a consequence higher prices for a raw material that is essential to the expansion of manufacturing and infrastructure.

98. The price of copper concentrates, unrefined copper, as well as that of most semis is determined as a reference to the price of refined metal. The latter is fixed mainly in exchanges (the London Metal Exchange for most international transactions and New York's Commodity Exchange for the United States). Price formation in such terminal markets reflects the trends of supply and demand, as well as the action of trade-related and non-trade-related market agents. Given the likely marginal impact of the UR on trade in refined copper, the Round will probably have no sizeable direct effect on copper prices.

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[17] Examples of direct Japanese ownership of copper mining operations overseas are Mitsubishi's partial ownership of Escondida (Chile) and Chino (United States) and Sumitomo's stakes in Morenci (United States) and La Candelaria (Chile). This contrasts with the traditional post-war pattern, in which Japan typically limited its involvement in foreign copper mining operations to financing and granting of long-term purchase contracts

[18] Sumitomo and Mitsubishi already are partners in the Pasar (Philippines) and Chino/Hurley (United States) smelter/refinery complexes, respectively. Mitsubish has announced its participation as partner in the planned smelters/reineries of Gresik (Indonesia), Yanbu (Saudi Arabia) and Rayong (Tahailand), while Sumitomo should take part in the launching of the Tonling complex (China).

99. The most tangible results of the UR in terms of cuts in tariffs affecting copper trade will be at the **semifabricating** stage in industrialized countries, since their average level will be reduced in the European Union, United States, Japan and Canada. However, the potential trade-creating effects of these tariff cuts will probably be superseded be the following factors:

- Given the essentially regional pattern of trade in semis, regional trade agreements are bound to have a stronger impact that the cuts in MFN rates scheduled for industrialized countries. The main agreements with an impact on semis trade are or will be those between the EU and its neighbouring countries (Central and Eastern Europe and Turkey); NAFTA and its possible extension southwards; and, in the medium term, APEC.
- The capacity for exporting copper semis will be determined more by the relative economic performance of countries than by market access barriers. In other words, changes in supply capacity in exporting countries will generally be more important than the level of tariffs in importing markets in shaping future international trade in copper and copper alloy semis.

100. In developing countries, given the high level at which tariffs have been bound (in those cases in which they have been included in the countries' schedule), the tariff actually levied by governments will depend on the developments of domestic demand for copper semis and on the level of national production of these commodities. In countries with a potential for development of a domestic semifabricating industry, governments are likely to offer the national industry some level of tariff protection, given the importance of this sector in the process of economic development.

Annex

REGIONAL DISTRIBUTION OF PRODUCTION AND DIVERSIFICATION

1. The main flows of international trade in copper at its various processing stages are a consequence of the uneven regional distribution of production and consumption of the metal at its various processing stages. As the processing of copper advances downstream, the market share of industrialized countries increases, while that of developing countries diminishes. Whereas the former control roughly on third of world mine output, they account for more than half of refined metal production and for a still higher percentage (65%) of semis output. The portion of world production accounted for by developing countries, by contrast, declines from half at the mining stage to one third in refining and falls further to 28% at the semifabricating level. This is, however, a significantly lower degree of concentration in developed countries than the one prevailing in the past (table A1).

2. Over the last thirty years, copper processing in developing countries has increased significantly. Whereas in the early 1960s they produced 21% of world refined output, in 1992-1994 they accounted for 34% of the total. At the semimanufacturing stage, the growth of their importance to the world market was much more significant, particularly since the mid-1970s. Their share of world output grew slowly from 7% in the early 1960s to 16% 20 years later. During the 1980s, this trend accelerated, so that in 1992-1994 they accounted for 28% of the world total (table A1).

Table A1

Regional share of copper production by processing stage, 1962 - 1994

(percentage)

Region	1962 - 1964				1972 - 1974				1982 - 1984				1992 - 1994			
	concs	unref	ref	semis	concs	unref	ref	semis	concs	unref	ref	semis	concs	unref	ref	semis
DMEC	40.9	45.3	64.0	75.5	40.1	47.8	58.7	72.4	30.1	42.2	50.2	64.4	35.4	46.8	53.3	65.4
America	*32.9*	*32.9*	*38.3*	*31.3*	*31.1*	*27.2*	*30.1*	*27.8*	*21.6*	*17.8*	*21.3*	*22.5*	*26.4*	*22.2*	*24.7*	*23.0*
Europe	*2.0*	*4.0*	*18.1*	*35.5*	*2.3*	*5.0*	*14.6*	*30.3*	*2.4*	*8.0*	*14.4*	*26.5*	*2.7*	*8.2*	*14.2*	*28.1*
Asia	*2.4*	*5.5*	*5.5*	*6.7*	*1.4*	*10.9*	*10.9*	*12.1*	*0.6*	*12.0*	*10.9*	*13.3*	*0.1*	*11.6*	*10.4*	*12.4*
Oceania	*2.4*	*1.8*	*1.8*	*1.6*	*3.0*	*2.3*	*2.2*	*1.5*	*3.0*	*2.2*	*2.0*	*1.3*	*4.2*	*3.2*	*2.8*	*1.3*
South Africa	*1.2*	*1.1*	*0.3*	*0.6*	*2.3*	*2.3*	*1.0*	*0.7*	*2.5*	*2.2*	*1.6*	*0.8*	*2.0*	*1.6*	*1.1*	*0.6*
Developing ctrs	44.2	39.6	20.6	7.3	42.4	33.9	22.8	9.6	50.8	38.5	30.1	16.3	50.1	37.7	34.4	28.0
America	*18.3*	*16.4*	*6.2*	*2.1*	*14.9*	*12.4*	*7.2*	*3.4*	*22.7*	*17.6*	*13.1*	*4.2*	*29.2*	*19.7*	*17.2*	*4.6*
Africa	*20.2*	*19.5*	*11.1*	*0.2*	*17.6*	*17.0*	*11.0*	*0.3*	*14.5*	*13.0*	*8.7*	*0.3*	*5.7*	*5.2*	*4.5*	*0.3*
Asia/Oceania	*4.5*	*2.6*	*2.5*	*3.9*	*8.5*	*2.7*	*3.1*	*4.8*	*12.2*	*6.5*	*7.0*	*10.5*	*14.2*	*11.9*	*12.0*	*22.6*
Europe	*1.3*	*1.0*	*0.9*	*1.0*	*1.5*	*1.8*	*1.6*	*1.1*	*1.5*	*1.4*	*1.3*	*1.4*	*0.9*	*0.9*	*0.7*	*0.5*
Countries in Eastern Europe	15.0	15.1	15.4	17.1	17.5	18.3	18.5	18.0	19.0	19.2	19.7	19.3	14.6	15.5	12.3	6.6
WORLD	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: MGAG and ICSG

concs - concentrates; unref - unrefined; ref - refined; semis - semifabricates

Note: Semis production estimated by refined copper consumption data

3. Output of refined metal and of semis in developing countries did not grow at the same rate over that period. Additionally, those countries whose production and exports of refined copper expanded most were generally not the same as those where semis output increased at the quickest rates. In the developing world, the largest producers of refined metal are (in decreasing order) Chile, China, Zambia and Peru, whereas the major producers of semis are China, Taiwan Province of China, Republic of Korea, Brazil and India (in both cases the countries mentioned account for almost 70% of the developing total). This shows that the factors that determine the geographical location of mines, smelters and refineries are not always the same that cause the location of semis mills.

4. The discrepancies between the geographical location of copper production at different processing stages raises the question of diversification. Diversification may happen both **into** copper (i.e., countries that do not produce the metal start doing so) and **within** copper (i.e., countries increase the share of more processed stages in their production and/or exports). The factors that affect horizontal and vertical diversification in copper will be examined hereafter.

5. In most developing countries, diversification into copper in the post-war period happened at the **mining** level, rather than at the smelting/refining or semifabricating stage. The horizontal diversification into copper mining in developing countries depends, among other factors, on geological potential, the availability of capital to develop it, production costs, etc. (supposing, of course, there is demand for the mine output, whether processed or not). In what regards the first requirement, the largest copper reserves among developing countries are located in Chile, Mexico, Zambia, Indonesia, Zaire, Philippines, Peru and Papua New Guinea, with Chile accounting for over one fourth of the world's total reserves. The availability of capital to develop these reserves is a critical variable, given the high amounts involved in developing new mines. High investment needs are a consequence of:

- high financial requirements already at the pre-production phase (exploration, feasibility study);
- high capital intensity of mining activities;
- the fact that mining is the most costly of all phases of copper processing, in terms of capital investment required by unit of output (UNCTAD (1984), p.41);
- infrastructural requirements render some deposits amenable to mine development only if they are very large or have high grade ore.

6. High capital requirements act as a deterrent to diversification into copper mining, especially on the part of small firms. The latter are further hindered by two features of the mining industry:

- the high risk involved in the exploration phase;
- strong instability of metals markets and prices. Mining companies must have financial resilience in order to survive during periods of falling prices and demand, which tends to favour large firms *vis-à-vis* small ones.

7. The consequence of these factors is that during the last 20 years, copper mining has tended to be developed essentially in large plants, rather than in small operations.

8. In developing countries, until the 1960s most of the capital for development of new plants was provided by transnational corporations originating from industrialized countries, which controlled virtually all of the copper mining and metallurgical industry in the developing world. This flow was drastically reduced after the nationalizations of the 1960s and 1970s. Thereafter, the State stepped in and undertook on its own the development of new mining projects (which in many instances were integrated to metallurgical plants). This was the case of India, Islamic Republic of Iran, Oman, Turkey, Brazil and Morocco, apart from those countries where nationalizations had given birth to large State-owned companies (Chile, Zaire, Zambia, Peru, Mexico). Alternatively, the State formed joint-ventures with transnational corporations, which saw partial national ownership not only as a source of financing for the new mining projects, but also as a sign of political backing for their presence in the host countries. Such a type of arrangement led to the development of copper mines in Indonesia, Papua New Guinea, Malaysia and Botswana.

9. Since the mid-1980s, however, States have seen their capacity to finance the building of new plants and the expansion of existing operations drastically reduced. Therefore, many of them changed their mineral policy from the emphasis on state-driven development to the creation of economic and political conditions that

would succeed in fostering private investment in their mining/metallurgical industries. Given the high amounts of capital needed to develop new projects, almost all new large mines are at present undertaken by transnational corporations from developed countries or by joint-ventures between them and national companies.

10. Thus, diversification into copper mining in recent and coming years has happened (and will continue doing so) in countries that have geological potential and have succeeded in attracting foreign investment into mining. By far the most significant example in this sense is Chile, which, as mentioned, has the largest reserves of the metal. All major international mining companies have developed large mining projects in that country or are in the process of doing so (e.g., RTZ, Mitsubishi, Falconbridge, Phelps Dodge, Anglo American Corp., Sumitomo, BHP). Other countries that have also succeeded in attracting foreign investment to copper in recent years have been Indonesia, Peru, Argentina, Turkey, Mexico, Zimbabwe, Botswana, Russian Federation, Brazil and Cuba.

11. The next point to be examined is diversification within the copper processing chain, i.e., how copper mining countries start further processing their mine production. In other words, what circumstances lead developing countries to process the output of their mines to blister or refined metal or even semifabricates, rather than exporting it as concentrates.

12. During the last 30 years, new copper **smelters** in developing countries have only been built where some operating mining capacity existed, which provided at least part of the supply of raw materials to the smelter. This means that diversification into copper production did not take place at the smelting/refining stage without the presence of upstream mining activity. All copper smelters built in developing countries since the 1960s were somehow integrated to mining operations in the same country, even though in some cases they had to import concentrates in order to complete the input requirements for their smelters.

13. Smelters were not built in all countries that commissioned new mines, nor was the new smelting capacity always as large as domestic mining capacity. On the contrary, the opposite was generally the case, i.e., from the 1970s onwards, a significant share of the new mine copper output of developing countries was exported in the form of concentrates, rather than further processed domestically. The main reasons for this were:

- the existence of demand for copper concentrates on the part of industrialized countries that have a smelting/refining capacity that significantly exceeds their domestic mining capacity (traditionally, Japan and Germany and, more recently, Spain, Brazil, Republic of Korea, Finland, Philippines and China);
- the scale of operations for smelters to be financially viable, which is presently estimated at a minimum annual capacity of 100 kt Cu. The large scale required has two consequences that hinder their building in developing countries: i) high initial investment requirements (generally above US$ 300 million), despite the fact that the capital cost per unit of metal is lower than in mining; ii) the building of smelters is not economically justified in countries with a small mining capacity, unless they have a domestic consuming market that absorbs the bulk of the smelter's output[a];
- the higher capital cost of building of greenfield smelters (i.e., new plants) than of expanding the capacity of already existing operations makes companies generally favour the latter option rather than the former. This reinforces the trend of processing concentrates in countries that already have installed smelting capacity, rather than building greenfield smelters in countries that do not possess them;
- the location of several mines close to port facilities but far away from the respective countries' physical and social infrastructure. It leads companies to concentrate scarce human and physical capital on mining rather than on metallurgy. Moreover, the cost per unit of output of shipping concentrates abroad plus smelting/refining charges is frequently lower than that of building processing facilities in the same country (Kirthisingha (1982)).

14. In developing countries that have a long history in copper mining, smelter and refining plants were built

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[a] This partly explains on one hand the absence of smelters not only from small mine producing countries (Morocco, Malaysia), but also from those with large mining capacity (Papua New Guinea, Mongolia). On the other hand, the presence of large or growing domestic demand for copper metal from semifabricators justifies the smelters/refineries in the Republic of Korea and, in the future, Indonesia and Thailand.

by the original owners of the mines (i.e., foreign companies), before they were nationalized in the late 1960s and 1970s (Zaire, Zambia, Chile, Peru, Mexico). Since the 1960s, however, given the obstacles to investing in new smelter plants, as well as the reflux of foreign investment, building of most smelters commissioned in developing countries was only enabled by the state's total or partial investment. This happened in Chile, Peru, Mexico, Brazil, Islamice Republic of Iran, Philippines, India, Republic of Korea, Taiwan Province of China, Oman, Botswana and Zimbabwe. The only major exception was the Tsumeb smelter, financed exclusively by private investment in Namibia (at that time, under South African administration).

15. As happened at the mining level, the capacity of developing country States to finance new smelter projects decreased over the last 10 years. However, whereas at the mining stage private investment has filled the gap and is responsible for the bulk of capacity growth in these countries, it has been much more reluctant to do the same at the smelting level, due to the factors pointed out above. Thus, state organisations will fund the development of new plants alone or in association with private investment in Chile, Islamic Republic of Iran, Pakistan, Saudi Arabia, as well as China. The only cases where private investors (transnational corporations in joint-ventures with local companies) plan to build greenfield smelters in countries that at present do not produce unrefined copper are Indonesia and Thailand.

16. At the **refining** level, largely the same obstacles that hinder developing countries' diversification into smelting limit their further processing into refined metal. Most of the concentrates processing projects already built in developing countries comprise both smelting and refining plants. There have been no cases where refineries were built without being integrated to smelters or in countries where the corresponding smelting capacity was not available in order to supply the raw material for them. The opposite is true, i.e., some smelters have been built without the corresponding refining capacity, with the surplus unrefined production being exported. This is the case of Chile, Mexico, Zaire, Peru and Namibia, which are the major exporters of unrefined copper.

17. On the other hand, a factor that has favoured the processing of mine production up to the refined metal stage in mining countries over the last 15 years has been the development and spread of the solvent extraction-electrowinning (SX-EW) technology. The production of high-grade copper cathodes through SX-EW accelerated during the 1980s and will continue doing so until the next century. The spread of large scale SX-EW plants has been particularly strong in Chile, whose copper refining capacity using this technology grew from 50 ktpy Cu to 135 ktpy Cu between 1980 and 1990 and is bound to reach 1.8 mtpy Cu by the end of the century.

18. The last stage of vertical diversification refers to the production of copper **semifabricates** ("semis"). The factors that affect location of production and international trade at the semis level are quite different from those that explain the regional distribution of copper production and trade from the concentrates to the refined metal stage. Whereas several developing countries have succeeded in processing the bulk of their mine production up to the refined metal stage, most of them do not further process the refined metal into semifabricates. The main reason for this is that in all countries (industrialized or developing) the copper semifabricating industry evolved as a consequence of the growth of domestic demand. Consumption of semis, in turn, is derived from the production of final products, i.e., electric and electronic products, industrial machinery and equipment, consumer and lighting engineering products, transportation equipment, communication equipment, as well as building. In other words, it depends on the country's level of industrialisation and on the scale of the industrial sector. Therefore, the copper semifabricating industry is limited to some high and middle-income countries (Kirthisingha (1982)).

19. Thus, a country's volume of semis production is directly linked to that of industrial output and only in a few cases has the domestic semis industry grown to such an extent that the countries became large net exporters (e.g., Belgium, Germany, Japan, Taiwan Province of China). It has not happened that a country develops a copper semifabricating industry directed mainly to foreign markets to start with. In most countries copper semis production is absorbed by the domestic market or exported to markets closely integrated to those of exporting countries. Therefore, the main international trade flows in these products are those among European countries, NAFTA countries, as well as among East Asian nations.

20. Even though all major producers of copper semis possess copper smelting/refining plants (with the only exception of Taiwan Province of China), domestic semifabricating capacity usually does not correspond to the refining capacity. Therefore, industrialized countries, which account for the bulk of world copper semis

output, are large net importers of refined metal. The same is true for some relatively more industrialized developing countries (Taiwan Province of China[b], China, Republic of Korea, Brazil and India). Developing countries that do not have copper smelters/refineries but have diversified into copper at the semifabricating stage are Thailand, Malaysia, Indonesia, Argentina and Venezuela. They import the bulk of the raw material requirement of their semis mills in refined metal form.

21. Other obstacles to the growth of semis production in developing countries are:

- the development experience over the last 30 years has shown that mining countries tend to be slow growers as compared to other developing countries (UNCTAD (1993), p.8). This entails low chances that their domestic industry will raise its demand for copper semis to the point of creating economies of scale that foster the development of a domestic semifabricating industry (i.e., that their copper industry will integrate downstream to semifabricating);
- although some copper semis are standard commodities (e.g., copper wire), some other have to respond to users' specifications and high technical requirements. In these cases, geographical proximity between the semis mill and the industrial client becomes an advantage and, conversely, a barrier to long-distance trade. Moreover, they may require a higher level of production technology;
- the existence of some degree of vertical integration (forward and backward) between copper refining and semifabricating mills in Japan, Western Europe, United States and Canada (all of them developed countries[c]);
- the multiplicity of clients of semis, as opposed to the reduced number of purchasers of refined metal or to the even more limited group of importers of unrefined copper and concentrates.

22. The analysis outlined above points to the economic and technical characteristics of the world copper industry as the main reasons for the higher concentration of downstream copper processing plants in large industrialized countries and in developing economies with a higher degree of industrialisation. Tariff barriers have played a role in reinforcing these trends, particularly in the initial stage of the establishment of national metallurgical industries. At present tariffs on unwrought copper have to a large extent been eliminated or reduced to low levels in developed countries or will be cut in the coming years (in Japan),as has been shown along this paper. Developing countries which are becoming important consuming markets for copper, by contrast, will probably adopt the same sort of policy that industrialized countries followed in the past.

23. As for semifabricates, exporters have faced considerable tariff escalation in the past and will continue to do so in the future. The reason for that is that the implementation of the Uruguay Round agreements will not eliminate it in developed countries, though escalation will be reduced in absolute terms. As for growing markets in the developing world, they are likely to levy higher tariffs on semis than on unwrought copper. The crucial point for success in exports of semis, however, is not lower market access barriers, but the previous establishment of a domestic semifabricating industry that supplies (at least initially or partially) the domestic market. Despite the higher tariffs levied on these products and the quantitative restrictions applied by industrialized countries, those developing countries whose industrial growth has warranted the establishment of a sizeable semifabricating industry have succeeded in exporting limited amounts of semis to developed and other developing countries. This was the case basically of Taiwan Province of China and Republic of Korea and, to a much lesser degree, China, India, Malaysia, Mexico and Brazil. The volume of their exports have been determined by the size of their semifabricating industry and that of their domestic markets, rather than by the level of market access barriers.

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[b] Originally, Taiwan Province of China had a small mining capacity and later it built two smelter/refinery complexes, which supplied part of its refined metal requirement. However, they were closed down in 1984 and 1990, respectively, and since then its semifabricating industry has depended almost completely on imports of refined copper.

[c] The difficulties in having the same sort of forward integration in developing countries without large domestic markets are highlighted by the fact that Codelco and ZCCM (the largest copper mining/metallurgical companies of Chile and Zambia, respectively) are partners in joint-ventures that operate a semifabricating mill. However, the latter are not located in the countries of origin of these companies, but in Germany and France, respectively.

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